Pit and Quarry

Member A. B. C.

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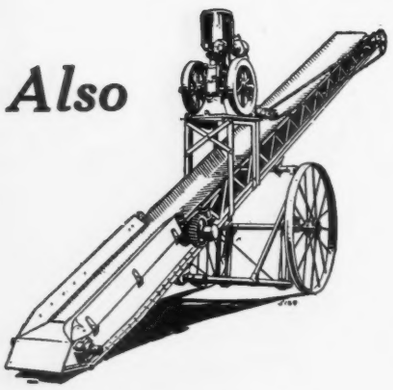

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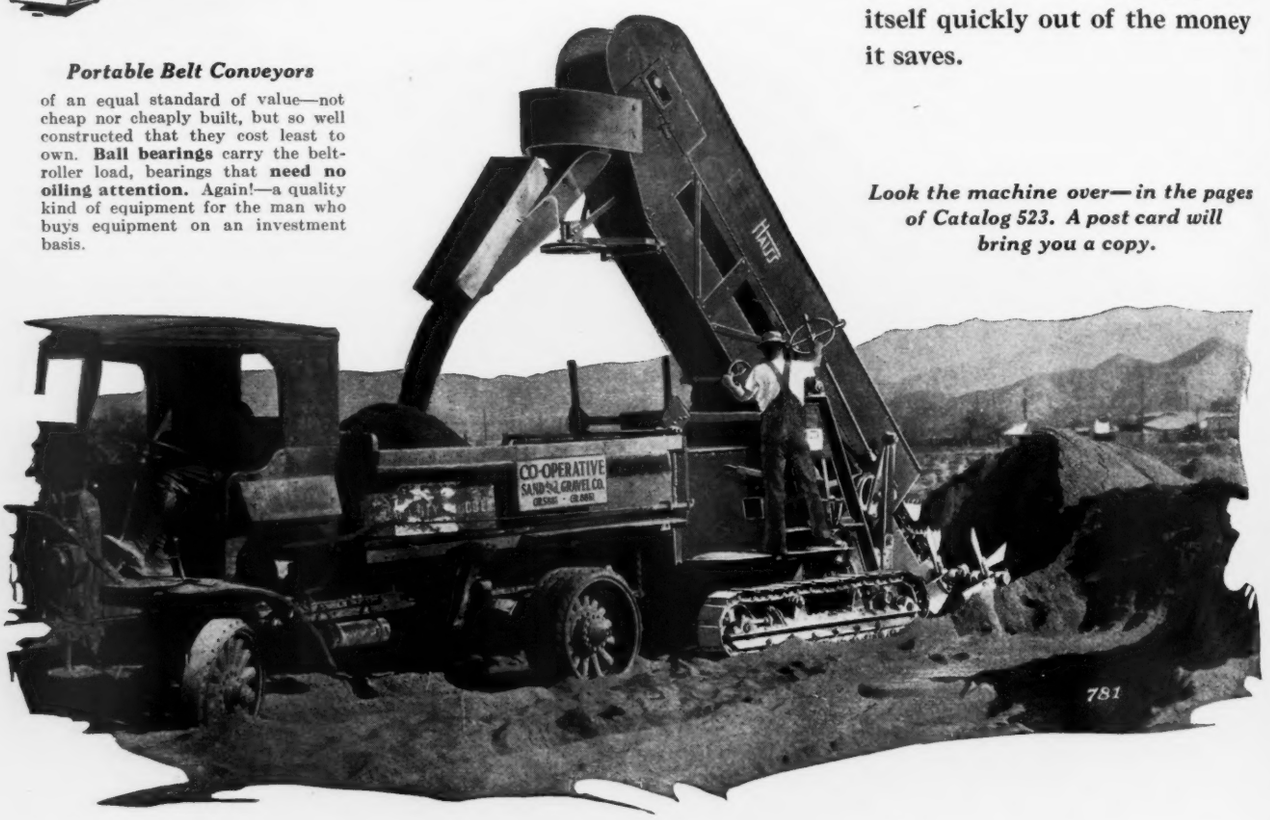

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Pit and Quarry

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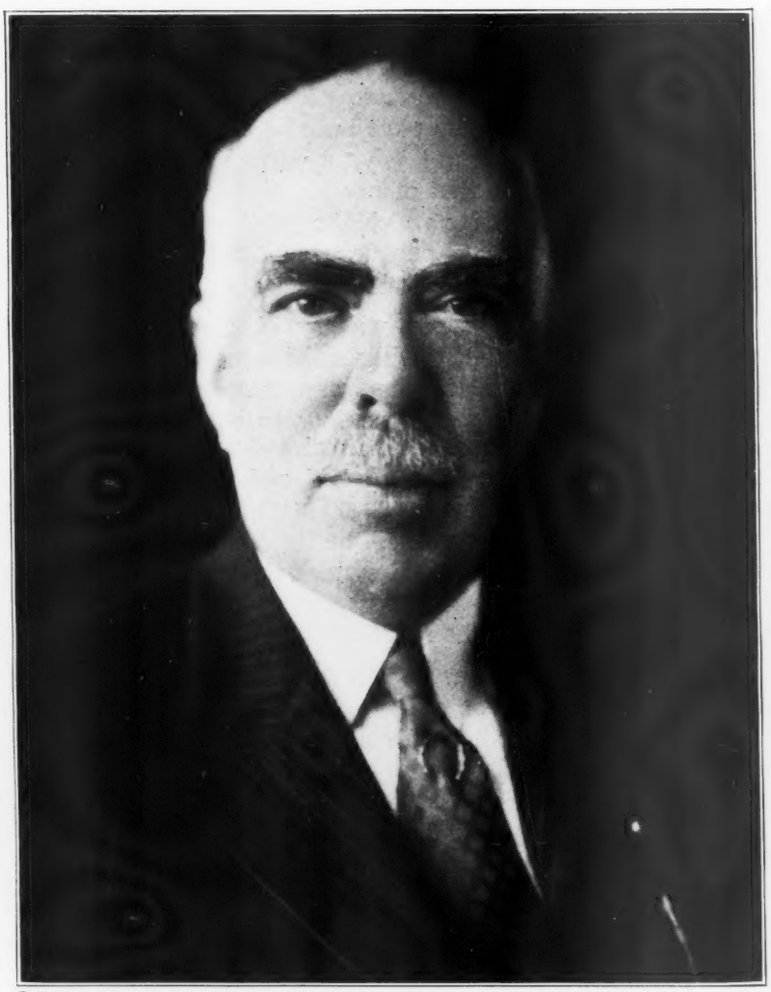
MEN OF THE INDUSTRY

The portrait printed on this page in each number of PIT AND QUARRY is taken from our files and its selection is without significance as to current events or as to the position of the individual in the industry.



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R. M. Dravo

President, Keystone Sand and Supply Company,

Pittsburgh, Pa.

The New PIT AND QUARRY

THE consolidation of *Cement-Mill and Quarry* with PIT AND QUARRY, which was announced in the last issue of this journal, has provoked widespread comment and approval among PIT AND QUARRY'S readers. On all sides the change has been recognized and applauded as a development full of significance for the pit and quarry industries.

Both PIT AND QUARRY and *Cement-Mill and Quarry* subscribers have been lavish in their praise of the plan by which the policies of both publications are to be combined, and they express complete confidence in PIT AND QUARRY'S ability to provide an even higher type of editorial service than that to which they have been accustomed. Every branch of the pit and quarry industries and every variety of reader interest from that of department head to that of president are represented in the hundreds of commendatory letters which the publisher has already received, and the spirit of confidence and encouragement that runs through them all will stimulate the editors to new and still greater efforts.

In the first consolidated issue, which will appear September 11, old *Cement-Mill and Quarry* readers will see the same features that won their approval in the past and, in addition, many features which, although old to PIT AND QUARRY readers, will be new to them. PIT AND QUARRY'S readers will find, besides the features already familiar to them, those which have been taken from *Cement-Mill and Quarry.* Both groups of readers will discover in the new PIT AND QUARRY still other features which will appear for the first time and will be the first evidences of the broadened editorial policy. The economies which the consolidation has brought about will make possible still further improvements in the extent and quality of the editorial service to be rendered to PIT AND QUARRY readers, and these betterments will become evident from time to time.

Advertisers too, have been quick to see the advantages of the consolidation policy. The elimination of one trade paper from their advertising schedules and the enhanced prestige and greater influence which PIT AND QUARRY will hereafter enjoy as the journal having the largest paid circulation in the pit and quarry field are the points stressed in the many approving letters received from them. Without exception, they voice unqualified endorsement of the consolidation idea and pledge their continued encouragement and support.

Sand and Gravel Plant in Des Moines, Iowa Has Unusual Method of Excavating

Scraper and Dredge Pump Combined to Advantage

By W. E. TRAUFFER

MOST of the larger sand and gravel plants in and near Des Moines, Iowa, last March formed an organization called the Central Sand and Gravel Sales Company. This organization handles all sales for its members on a ratio decided upon at the time of its formation. Results have been very satisfactory and the producers have benefited through the elimination of crosshauls and price cutting which formerly cut deeply into profits.

The Hawkeye Cooperative Sand and Gravel Company is one of the members of this organization. It holds the distinction of having the closest producing plant to the heart of the city, the location at 822 S. W. 9 St. on the Raccoon river, being only a mile from the main business and industrial district.

Excavation of Material

The method of excavating the material from the Raccoon river is rather unusual. The dredge formerly used was sunk by floating ice last spring causing a considerable loss, and it was decided to install a system that would not be affected by ice or floods. A Garst 1-yd. power plow scraper operating on a 300-ft. span was installed with the tail pulley anchored on the river bank opposite the plant. This scraper drags the material up the river

Scraper emerging from river

Dredge nozzle in sump with scraper in background

Concrete mixer discharging to truck

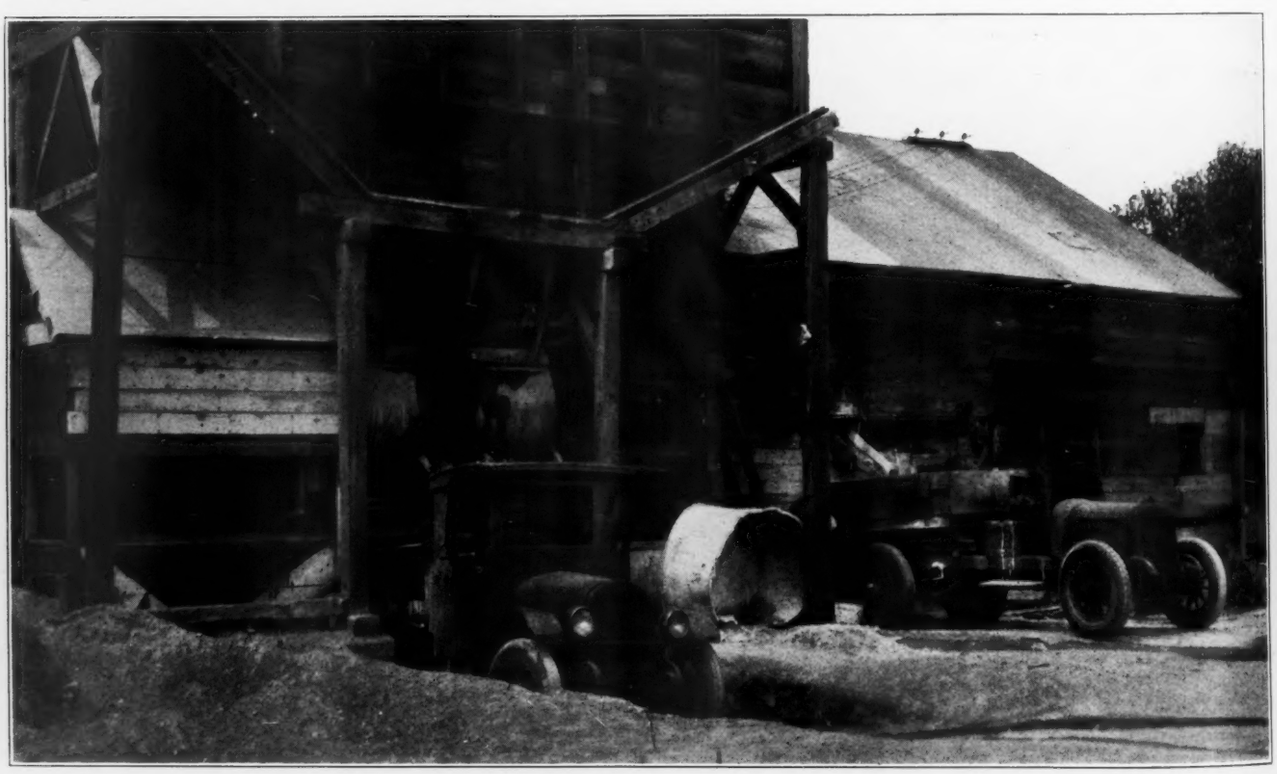
Scraper pulling load up bank

bank and into a small sump which had previously been dug into the bank. The scraper is operated by an American Hoist and Derrick Company two drum hoist gear driven by a 100-hp. Westinghouse motor. This motor is far too large for the present 1-yd. scraper but will be more suitable for a 2-yd. Garst scraper which is now on the property and will be installed when business demands. The cableway will then be run diagonally across the river with the haul downstream, giving the scraper system a higher efficiency.

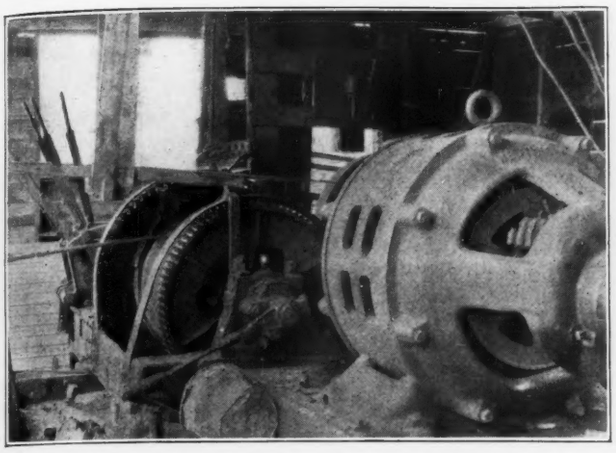
The material is salvaged from the sump by a Morris 10-in. centrifugal pump through an 8-in. pipe nozzle which is raised and lowered by a small Mundy hoist. The pump is belt driven by a 100-hp. G. E. motor which also drives the hoist. Because of the height of the river bank it was found necessary to dig a pit for the pump to keep it within the limits for efficient suction. The pump discharges into the plant through an 8-in. pipe line. A small Viking pump furnishes water for cooling the dredge pump bearings.

Material Handling

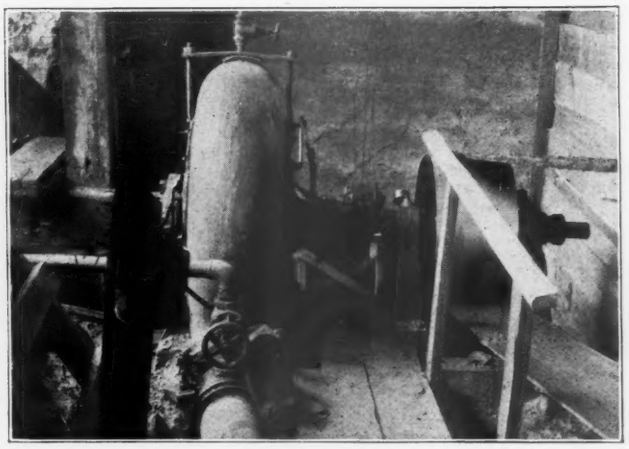
The pipe line discharges at the top of the plant into a hopper with an inclined stationary screen



Trucks being loaded with concrete and mortar



Hoist and motor for scraper



Pump in temporary location

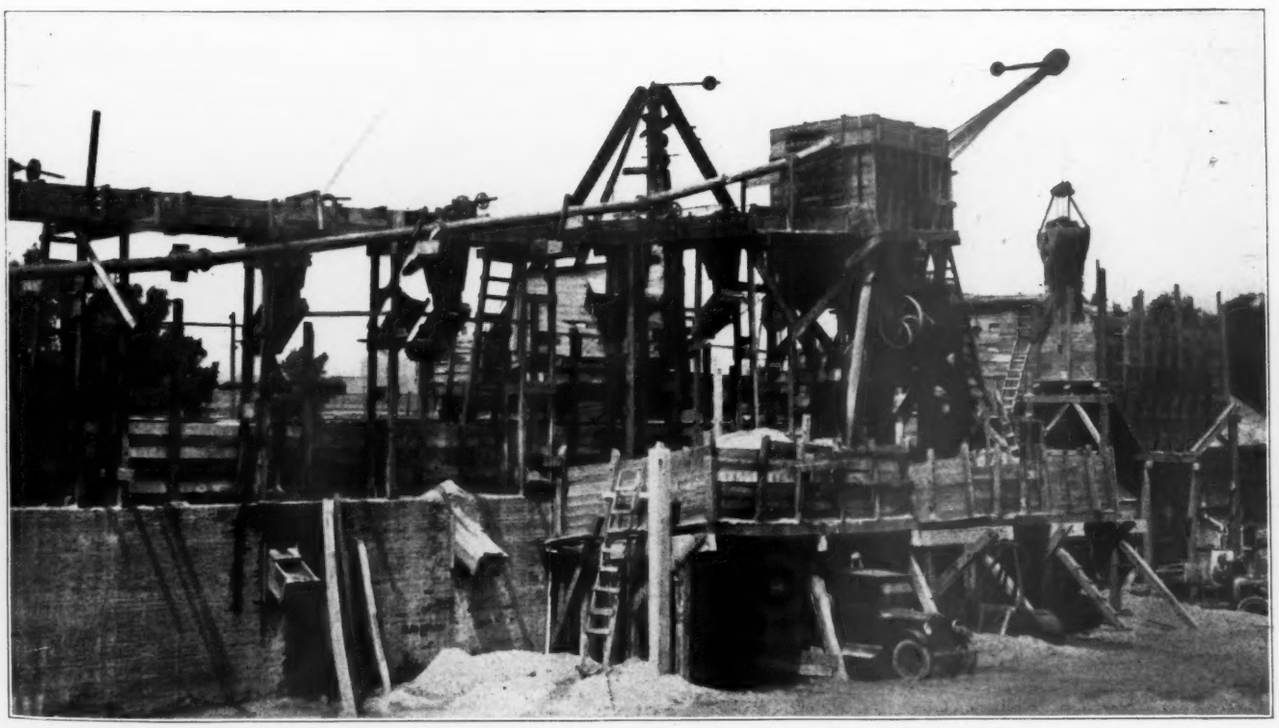
which separates the sand and gravel. The sand and water run into a flume where six Eagle Iron Works bleeders separate into three sizes of sand. The bleeders are all of the same size and type and work on the principle that the coarser sand will precipitate first. Considerable experimenting was necessary before the correct angle of the flume was attained to give the required sizes. The sand is deposited in three brick storage bins.

The gravel from the stationary screen goes to a small rotary screen which divides into three sizes of material. These are 1½ to ¾ in., ¾ to ¼ in., and ¼ in. minus or pea gravel. The gravel over 1½ in. goes to a box which is dumped when full. The screen is belt driven by a 10-hp. G. E. motor. The pea gravel and the medium sized gravel go to two wooden bins and the large gravel to a brick bin. Four additional brick bins are also used for dead storage.

A traveling stiff-leg derrick on rails above the brick bins does all of the rehandling. This is operated by a 50-hp. Westinghouse motor and has a 1-yd. Brownhoist clamshell bucket. Large gravel and sand are handled to a two-compartment wooden bin which, with the two wooden bins previously described, discharges directly into trucks for distribution.

Concrete and Mortar Plant

A concrete mixing plant and a mortar mixing plant are also operated in conjunction with the sand and gravel plant. These are the only ones in the city and are not under the control of the sales organization. They are operated under the name



South side of plant, showing crane handling material and trucks loading

Sand flume and bucket carrying material to bins

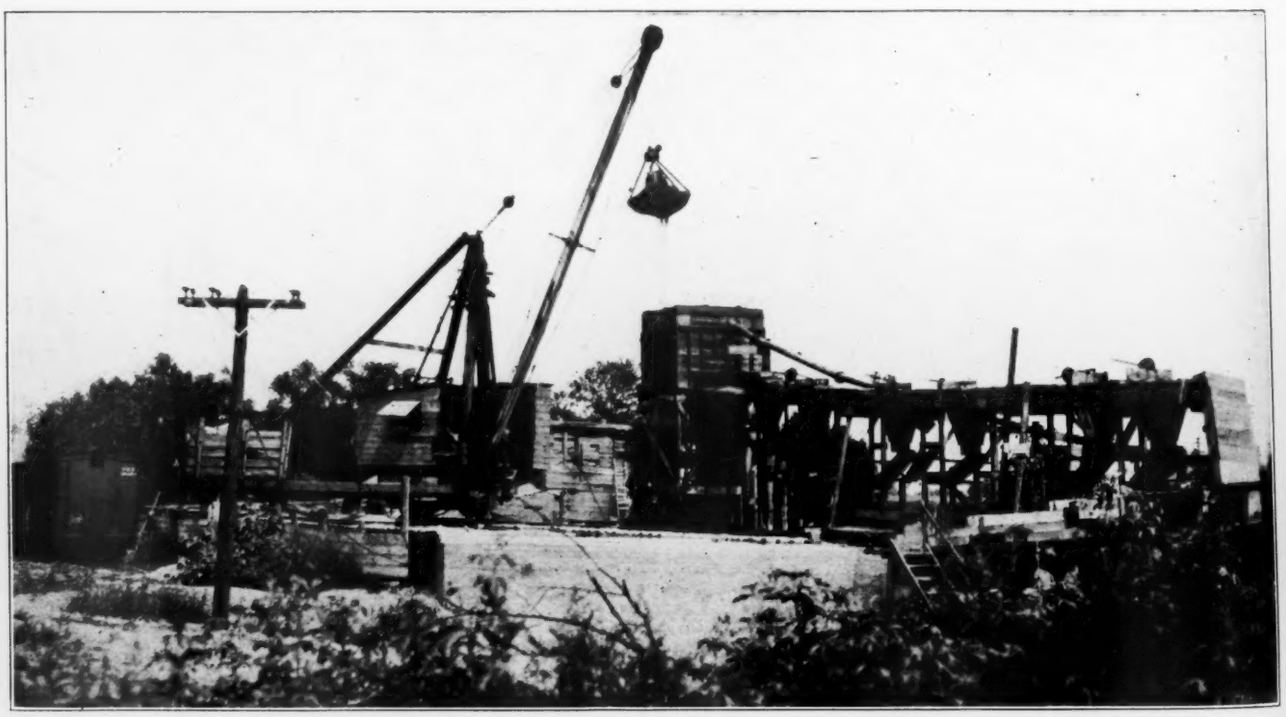
of the Des Moines Building Materials Company with the same officers as the gravel company. One of the conditions of the contract with the central sales office was that none of the other members would enter into the concrete business. The same derrick previously described handles stone and sand and gravel into wooden bins on top of the concrete plant and sand to a bin over the mortar plant.

Cement is unloaded in sacks from cars on a siding onto an inclined gravity conveyor which passes through the cement storeroom directly into the mixing plant, thereby eliminating unnecessary handling. The mixer is a Blystone 1-yd. revolving paddle type horizontal mixer driven through gears and a W. A. Jones dry plate clutch by a 25-hp. Westinghouse motor. A ½-yd. mixer of the same type can be used when demand requires. This mixer is belt driven by a 15-hp. motor with a Jones clutch. Mortar is mixed in a continuous trough mixer chain driven by a small electric motor. Sacked lime is unloaded from cars in the same manner as the cement.

Miscellaneous

Distribution of sand and gravel is divided equally between rail and truck. Terminal facilities are available for shipment over all railroads in and near Des Moines. Truck distribution is in six trucks owned by the company, additional trucks being hired when necessary. Concrete and mortar have been hauled successfully as far as 15 miles. Capacity is 500 tons of sand and gravel, 200 cu. yd. of concrete and 100 tons of mortar per day.

Officers of the Hawkeye Cooperative Sand and Gravel Company are: John Keefner, president; Albert Peterson, secretary and treasurer, and Joseph Keefner, assistant general manager.



Plant from southwest. Crane handling from storage bins to loading bins

Hydraulic Dredge Operates Successfully in Plant of Coogan Gravel Company

BY GEO. B. MASSEY

THE Coogan Gravel Company operates a gravel pit about two miles north of Chillicothe, Ill., on the Rock Island Railroad and located between the railroad and the Illinois River.

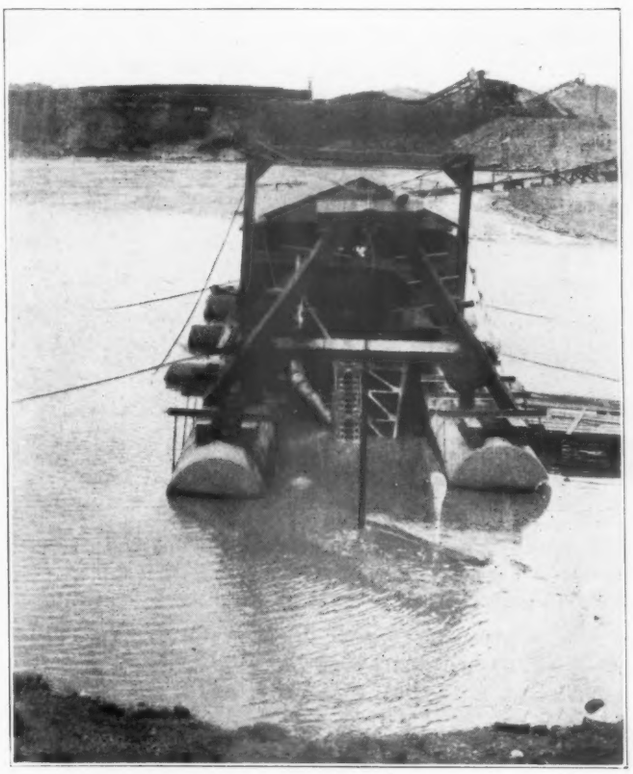
The gravel pit has no connection with the river, but consists of two ponds.

The output is 200 tons per hour and the classification is sand, pea gravel, 1 in., 1½ in. and 2 in. The 1 in., 1½ in. and 2 in. gravel is mixed when supplied for paving gravel and the character of the deposit may be judged from the fact that for 30 cars of paving gravel there are 4 cars of pea gravel and 3 cars of sand.

The operation was first started with a slack line cableway with a capacity of 50 tons per hour. The cableway was later replaced by a dragline, giving the plant a capacity of 100 tons per hour. The dragline was used down to the water level and excavated one of the ponds. As a larger capacity was desired, a hydraulic dredge was installed in the other pond with a capacity of 200 tons per hour. This is the present equipment.

With the dragline, the depth of digging was about 25 ft. of gravel with about 4 ft. of stripping, which had to be taken away mechanically at considerable expense. With the hydraulic dredge a depth of 50 ft. of gravel is maintained or 25 ft. below the water and 25 ft. above the water. The overburden is handled by the dredge itself and eliminated in the washing operation.

The dredge is a 12-in. Morris machine mounted on cylindrical tanks as pontoons and driven by electricity. The pump is driven by a 350-hp. slip ring motor, the 3 drum hoist by a 20-hp. squirrel cage, the cutter by a 20-hp. squirrel cage and the priming pump by a 50-hp. squirrel cage.



Bow view of dredge, showing ladder

The cutter is of the Swintek type and passes

Discharge pipe from dredge on pontoons and trestle. Water, silt and overburden discharge into pond in left foreground

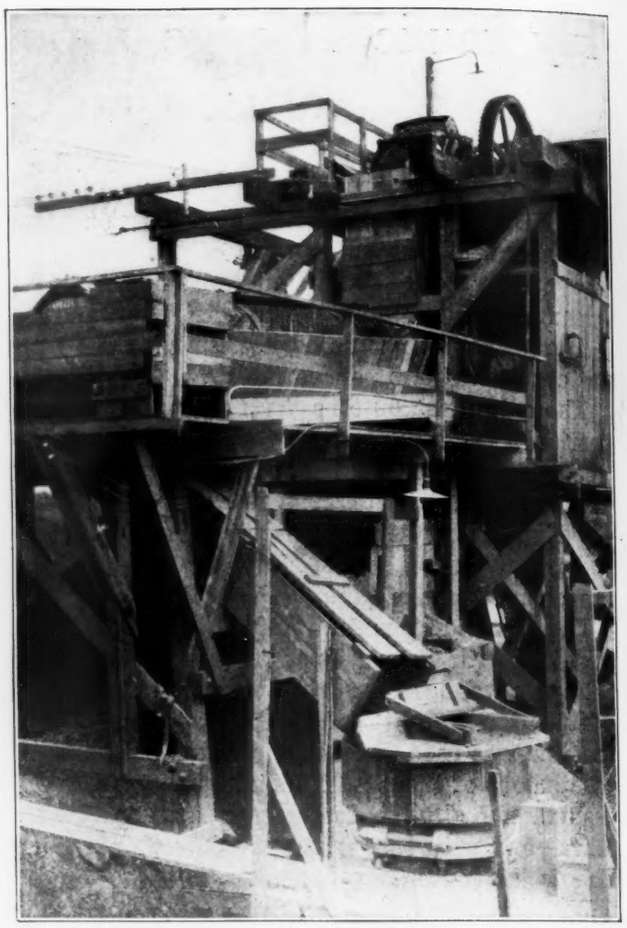
everything up to 7 inches, although 6 inches would be a better size for the 12-in. pump.

The reason for the excessive size of the priming pump motor is that a monitor is located on the bow of the dredge which directs the stream against the bank and cuts it down enough so that there are no heavy cave-ins on the ladder.

The dredge is held to its work by four lines, the two bow lines being led to two of the drums of the hoist, the other drum being used for the Swintek ladder. The two stern lines are handled by hand capstans, there being no spuds. The pump is a Morris manganese lined. The dredge has proved to be suitable for the work and very efficient.

Electrically operated dredge on steel cylindrical pontoons

The discharge is carried on pontoons a part of the way and on trestle work to the dewatering bin, the top of which is about 10 ft. above the water level in the dredge pond. The water is carried away by an overflow back into the same pond and the gravel is picked up by a digging elevator and carried up to the scalping screen. The elevator is a Link-Belt 36-in. and runs at a speed of 60-ft. per minute. This elevator is run by a 30-hp. squirrel cage motor.



Scalping screen above 25-ton storage bin, oversize passing to crusher in foreground

The scalping screen is a Telsmith, 48-in. by 20-ft. and is driven by a 15-hp. squirrel cage motor and scalps out everything over 2 inches, which

Belt conveyor delivering sand and gravel to sizing screens above storage bins

Dredge with monitor on bow throwing stream of water against bank

amounts to about 20 per cent of the material coming to the screen.

This material over 2 inches is by-passed to a Telsmith No. 8 crusher, which crushes everything to 2 inches. The crusher is driven by a 25-hp. slip ring motor. An 18-in. belt conveyor returns the material to the dewatering bin where it is picked up by the digging elevator.

The material 2 inches and under which is passed through the scalping screen falls into a wooden bin of 25 tons capacity from which it is carried on a Telsmith 24-in. belt conveyor, 200 ft. centers, up a slope of 18 degrees. This angle of elevation is slightly greater than the ideal as there is a slight tendency at times for the material to slide down the belt. This belt is driven by a 40-hp. slip ring motor through a Jones speed reducer.

The two sizing screens are located at the top of the storage bin. The screens are two Telsmith 48-in. by 20-ft. with 9-ft. sand jackets, ¼-in. mesh, and a 3 ft. extra jacket for ½-in. pea gravel. The screen itself consists of 4 ft. of scrubber, 6 ft. of ½-in., 4 ft. of 1-in. and 4-ft. of 1½-in. and 2 ft. of space for 2-in. rejects.

The two screens are in parallel and are each operated by a 15-hp. squirrel cage motor.

The water for washing in the sizing screens is supplied by two centrifugal pumps, each driven by a 50-hp. squirrel cage motor and located at the edge of the first pond, using the water which always stands in this pond. A silent chain drive is used for most of the small motors.

National Safety Congress Meets in Chicago, September 30

The Eighteenth Annual Safety Congress of the National Safety Council will convene in the Stevens and Congress Hotels, Chicago, Ill., September 30 to October 4, 1929. This convention is scheduled to be the greatest ever put on by the people responsible for the great safety movements as the program outlines some of the most interesting papers and discussions ever presented. There will be an abundance of entertainment, including visits to industrial, historical and other places of interest.

The Cement and Quarry Sections will have a full representation in the Congress. The men who have worked so earnestly to win records will attend to tell how a most hazardous mill has operated over years without a lost-time accident. On Wednesday all members of the Cement, Mining and Quarry Sections are invited to visit the Dolese & Shepard Quarry demonstration of modern explosives and an electrically controlled mechanical system.

Complete information and program may be had by addressing National Safety Council of Chicago, Ill.

San Antonio Portland Host to Manufacturers' Association

The beautiful lawn of the San Antonio Portland Cement Company at Cementville, Tex., was the scene of the annual midsummer frolic of the Manufacturers' Association of San Antonio, attended by more than 200 members of the association and their families.

A telegram of appreciation for the generous hospitality accorded them was sent by the assembled manufacturers and their families to Charles Baumberger, Sr., president of the cement company, who is now in California. Regret was expressed by the guests in their telegram that Baumberger, Sr., could not have been with them and participated.

The message also contained the congratulations of the fellow members of the association upon the wonderful efficiency of the plant characterized by them as the finest in the United States.

Charles Baumberger, Jr., had charge of the entertainment of the guests. He was assisted with the arrangements by Charles Baldus, president of the association.

Promptly at 7 o'clock the guests were ushered to long tables where a repast of barbecued meats and the customary additions were served. Souvenirs were presented to the men and women, and the children received bags filled with toys and candies. While the barbecue was being served, the Alamo brass band rendered a concert.

The event was concluded with a trip through the cement plant which proved to be a revelation to the fellow members of the manufacturers' association. Baumberger, Jr., and Baldus were the recipients of many congratulations from the guests upon the perfection with which the details of the midsummer event were carried out by them and their corps of assistants.

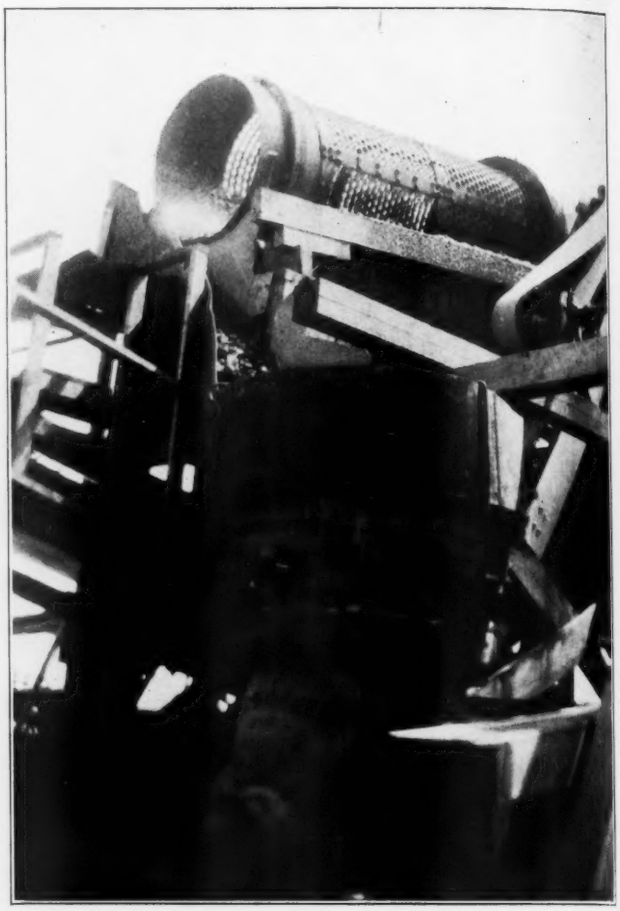
Ozaukee Sand and Gravel Company Produces Large Output by Dredging

BY S. S. WOLFF

THE Ozaukee Sand and Gravel Company of Ozaukee County, Wisconsin, operates a gravel pit that has a good geographical location and is well equipped to produce sand and gravel in large quantities.

The land occupied by this plant is situated near the Milwaukee river, and covers an area of over eighty acres. The pit is filled with water, the sand and gravel being recovered by a 10-in. pump supplied by Hetherington and Berner. The river varies in depth somewhat throughout the year, but the level of the pit is always about eight inches above that of the river. It is estimated that the supply of gravel is equal to about 50,000 yards per acre, or a total of approximately 4,000,000 yards.

All the water necessary to wash the gravel after the sand has been removed is pumped from the river. One other advantage in this pit which effects a considerable saving in operating expenses is the fact that very little surface stripping is necessary. In some spots the gravel touches the surface while the maximum stripping required at any point does not exceed twelve inches.



Oversize from screen passing to crusher

Loading bin. Vertical pipe at left carries water to screen. Belt conveyor at right delivers gravel to screen

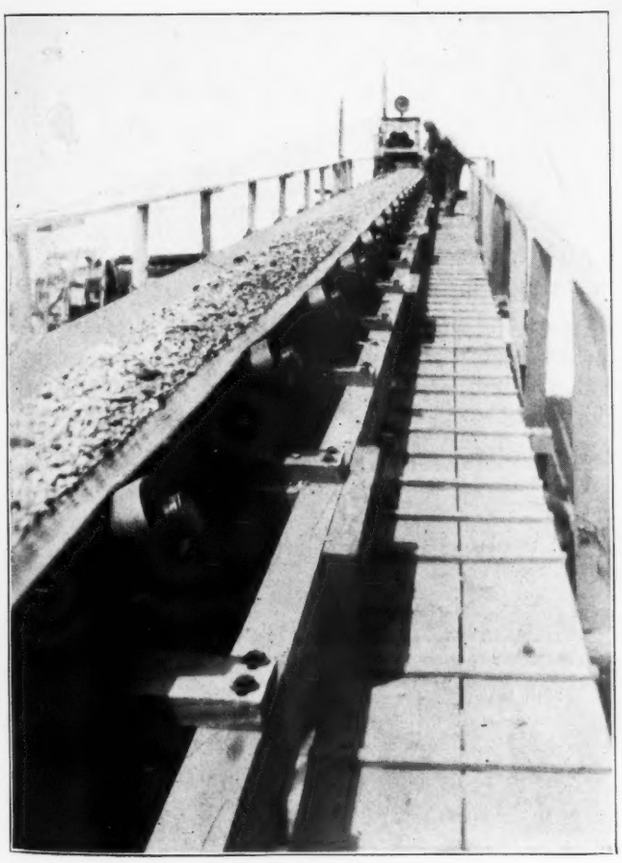
The gravel is pumped through a 10-in. suction, furnished by Hetherington and Berner, which can be submerged to a depth of about 45 ft. The depth of gravel varies from 35 to 50 ft. Approximately 15 to 20 ft. of this is above the water level of the pit. Hence, it is only necessary to submerge the suction from 15 to 30 ft. The barge which is used is 25 ft. long by 15 ft. wide, and houses the entire pumping equipment. This barge is operated very close to the shore and a stream of water is constantly thrown against the embankment, washing the gravel down under the suction. A small auxiliary pump driven by a 5-hp. motor supplies the water for this purpose. The continuous washing down of the gravel prevents sudden cave-ins, which might result in serious trouble and consequent delay in operation.

The Hetherington and Berner impeller type pump having a capacity of approximately 3,500 g.p.m. is driven by a 150-hp. Allis-Chalmers motor

running at 1,200 r.p.m., from which power is applied by means of a Texrope drive. The operating speed of the pump is 520 r.p.m. The gravel first passes through a steel drum known as a stone box supplied by Hetherington and Berner, which is equipped with grizzly bars.

The material enters this box at one end at a high level and leaves at the opposite end at a low level. In passing over the grizzly bars, stones which are exceedingly large are deposited on top of the bars. These are removed through an opening in the top of the box about twice a day. By this method all stones which are over about six inches in diameter are eliminated and do not hinder production. Possible injury to the equipment is thus also avoided.

After leaving the box, the gravel passes through the pump into a 10-in. pipe, and is conveyed to the plant. The pipe line is made up of sections 20 ft. long and is supported on pontoons each of which is built up of four 55-gal. drums, rigidly braced together. A rack is also provided for carrying the electric power cables to the barge. All the control equipment for the pump is located in the barge. As the size of the pit increases and the barge is moved out, another section of pipe is added to the line. A flexible section which extends from the pump to the pipe line permits a small amount of movement of the barge.



Gravel on way to screen

Looking down into crusher

About 15 to 20 per cent of the volume of material conveyed to the plant is solid matter. The remaining 80 to 85 per cent of water is later returned to the pit. The first task is to separate the sand and gravel. When the material reaches the plant, it is discharged into a box equipped with a sand screen through which most of the sand and water pass into the sand hopper. This hopper is provided with an overflow which conducts the sand and water back to the pit in case the hopper is filled to capacity. The sand hopper empties at the bottom into a long inclined box which is equipped with a double set of 12-in. screw conveyors furnished by W. Toetter and Sons.

This conveyor is driven by a Foote Bros. spur gear speed-reducer through a universal joint. The conveyor operates at a speed of 20 r.p.m. The coarse sand is forced up by the screw and is dropped on a belt conveyor. The water which runs off passes into a second screw conveyor box where a similar operation is performed and the fine sand is reclaimed. The two grades of sand are mixed

Sucker and position of barge. Shows relation between surface of deposit and the water level

Pontoons for pipe line and cable rack

together on the same belt conveyor which extends about 150 ft. to the sand storage pile. A 10-hp. American Electric motor operates the belt and screw conveyors.

The gravel which passes over the sand screen flows into a rotating screen where the small and large stones are separated. However, there is still some sand mixed with the gravel which must first

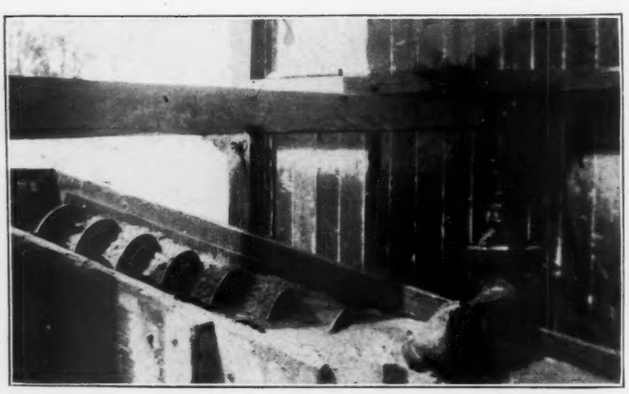
Motor driving screw conveyor through speed reducer and driving belt conveyor by chain

be removed. The Boehck rotating screen which is about 4 ft. in diameter and 12 ft. long is built up in sections, the first of which is perforated with 1-in. holes, and is known as the scalper. A baffle plate 6 in. high forms a barrier between this section and the others. Around the outside of this screen there is another screen which is punched with very small holes. These two screens rotate together. The water, sand, and gravel not exceeding 1-in. in size pass through the inner screen while only the sand and water can pass through the outer screen. In this way the sand is removed and carried back to the belt conveyor. Here it mixes with the other sand.

The gravel which does not pass through the outer screen falls into a separate bin and then on to a belt conveyor. The gravel which does not pass through the scalping screen is discharged into the next section. The other sections of the rotating screen have $1\frac{3}{4}$-in. mesh, and the gravel which passes through these screens is mixed with the smaller gravel on the belt conveyor. This conveyor is 250 ft. long and is driven by a 15-hp. American Electric motor. All stones larger than $1\frac{3}{4}$-in. are rejected by the screen and fall into an 8-in. Superior Allis-Chalmers crusher which is belt driven by a 30-hp. Allis-Chalmers motor. The crusher discharges the gravel onto a bucket conveyor which returns the crushed stones to the rotating screen.

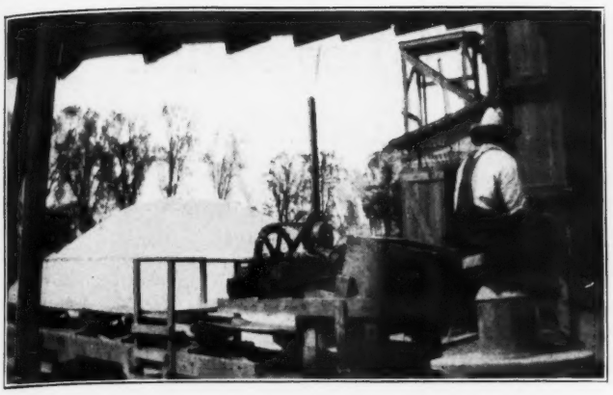
This process repeats itself until the stones have been crushed sufficiently to pass through the screen.

After the gravel passes through the screen onto the belt conveyor it is carried up to the sorting and scrubbing screen. This screen is very much like the first rotating screen, excepting that the



Sand screw, with water and sand intake from hopper

Pipe line from pit, at left. Sand conveyor at right Milwaukee River in background



Driving end of sand screw conveyor discharging onto belt conveyor

sections have different size meshes to separate the various sizes of gravel. The first section is blank and is called the scrubber jacket. In this chamber the stones are agitated and pass through a stream of water to be thoroughly washed. The water for this purpose is obtained from the river by a 30-hp. motor driven pump which furnishes about 450 g.p.m. The stones pass through this stream of water about 18 times before being assorted. A 15-hp. motor is used to drive the screen by means of a belt drive. After the gravel has passed through the scrubbing screen, it is ready to be sized.

The first sizing section has ¾-in. holes and separates out the pea gravel which is used chiefly for road spreading. The consumption of this gravel is the lowest of all sizes. After the bin has been filled the pea gravel is discharged into a pipe line which carries the gravel to the storage yards. In this way, trucking of the excess pea gravel from the loading bin to the yard is eliminated. The second grade of gravel is the 1-in. size, which is made up almost wholly of natural gravel. This size is used in building construction. The final grade is the 2-in. size, which is made up of about one part natural stone and one part crushed stone. This size is used mostly in road construction.

From this it will be seen that only a very small per cent of the total volume of gravel obtained from the pit must be run through the crusher. The advantage of this is that a steady stream of gravel is continuously traveling up to the sorting screen, and the efficiency of the plant is high.

Loading bins totaling 400 yd., supplied by the Boehck Machinery Company, are provided for loading into trucks. The capacity of the plant is approximately 100 yd. per hour. Of this amount about 35 per cent is sand and 65 per cent is gravel. The size of gravel produced can be controlled to a certain extent by adjustment of the crusher. At the present time, the output of the plant is quickly consumed. However, a large storage yard is available, equipped with a 1½-yd. Link-Belt clamshell for loading. Since sand and pea gravel are both conveyed directly into the yard, it is only necessary to truck the 1 and 2-in. gravel from the bins to the yard for storage.

A 2,300-volt line of the Milwaukee Electric Railway and Light Company system furnishes the electric power to this plant through a bank of 2,300-220 step-down transformers, consisting of three 50-kva. and three 25-kva. transformers. Two regulators are also used to stabilize the voltage. The entire plant, including plant storage yard, is operated by a crew of seven men.

Northwest Association Holds Summer Meeting

Everett, Wash., was selected as the convention place for the winter session of the Northwest Concrete Products Association and allied interests at the conclusion of its midsummer sessions held July 26 in Shelton, Wash. The assembled delegates decided on Everett after a lengthy discussion and thus Washington will have the pleasure of entertaining this large group at both sessions.

The convention held at the Memorial Building opened with a representative group from all important concrete products companies of the Northwest with several California delegates also present. Opening ceremonies included the annual address by President W. F. MacKenzie, an address of welcome by Mayor A. A. Bower, with a response by E. B. Ballinger of Seattle, which was followed by general committee reports.

At the noon luncheon, July 26, A. A. Cole and Walter Elliott were on the program, which was cut short to enable the afternoon discussions to start at once. Subjects discussed included "Cement," by Major S. E. Hutton of the Pacific Coast Cement Company; "Concrete Products in Everett," Sumner E. Paine, city engineer; "Salesmanship," by Harry Abel of Seattle; "Sidelights in Testing," E. F. Goodner, Northwest Testing Laboratories; "Cushman Power Development," illustrated lecture, L. J. Stannard, chief engineer of the project.

During the session ladies in attendance made a caravan trip to Lake Cushman, where they were conducted through the power plant. A banquet at Schroeder's Cove in the evening followed by a dinner dance and clam bake were features. At this banquet Samuel J. Humes, director of highways, and Mrs. Humes were guests, with local speakers on the "Lighting Standards," Fred Strange, and impromptu talks by members of the association.

The session of the second day opened with discussion of general routine, and the following subjects were given: "Concrete Drain Tile," Charles Delling, of Puyallup; "Concrete Lighting Standards," Fred Strange, Port Angeles; "Steel Reinforcing," Earl Bracken, Aberdeen, while Prof. S. H. Graf and G. W. Gleeson of the Oregon State College gave special talks.

Significant Phases of Pending Legislation For an Import Tariff on Cement

Editorial Survey of a Few Recent Developments in the Industry

THE acuteness of the injury that is being wrought in the American portland cement industry by the lack of any impediment to the importation of foreign cements is reflected in several documents that have come recently to the attention of PIT AND QUARRY. Our readers generally are aware that uneasiness has prevailed among our manufacturers of this essential commodity. The public at large reads so many contradictory press accounts that it has assumed a passive mind over the whole situation. Some people even have decided that much of the newspaper fussing is simply a smoke-screen promulgated by the cement industry to conceal handsome profits. Certain cities and states have taken legal steps to obstruct American manufacturers and actually purchase foreign-made cement for public use. We have declined to publish news items about such abuses because we have hoped that they would soon discontinue of their own course.

Another Plant Closed Down

There can be no doubt that a serious situation prevails when we read the statement issued by the vice-president of The International Cement Company concerning the closing down, on August 10, 1929, of its operations at Chuckatuck and Norfolk, Virginia. In citing low-priced foreign cement, admitted duty-free, as the sole reason for this action, Dwight Morgan says:

"We have kept our mills going just as long as we could provide storage space for the cement produced. We have operated at a reduced capacity for over a year in an effort to keep as many men as possible on the payroll. Now we face the accumulated effect of the continued and extensive use of imported cement by highway contractors and industrial constructors in South Carolina, by the state of North Carolina for its highway work, and the awarding of the Richmond, Virginia, city contract this year to foreign cement.

"At a time when normal building activity should keep our mills working to capacity to meet the demand we find our storage bins filled and therefore have no alternative. We must temporarily stop production. The wage scale paid the European cement worker is approximately one-fifth the wage scale paid the Virginia cement worker.

"Belgium has been the principal exporter to the United States and cement from that country as well as from other foreign countries does not carry any import duty. The result is, well-paid American workmen are placed in direct competition with poorly paid Belgian workmen. Cheap labor plus low transportation costs make it possible for the foreign manufacturer to offer his product in the Seaboard territory at a lower price than we can meet. The result of this competition is not felt in the cement industry alone, nor in Norfolk alone. Most cement manufacturers on the Atlantic Seaboard, Gulf Coast, and Pacific Coast have been operating at a reduced output for several years, with many cement workers unemployed.

"The Lone Star Cement Company Virginia, Incorporated, like other American cement manufacturers, has contested the invasion of its legitimate market by reducing prices to a point where there is little or no profit. We have made well-founded appeals to the loyalty, as well as the self-interest, of the American public, pointing out the fact that the disruption of the cement industry not only affects the cement worker, but that it has an effect on co-related industries and on retailers, wholesalers and manufacturers who must depend upon workers in these industries for their trade.

"Until we are successful in our efforts to maintain our rightful markets by securing an import duty on cement that will equalize the overwhelming difference in wages and protect the American workman from unfair competition that is undermining the American standards of living, we cannot operate our mill. We have done everything possible to keep our men employed, but now that our bins are filled we have no choice—the mill must close."

The Question of Sectionalism

It will be noted that Mr. Morgan stresses the plight of manufacturers along our seaboards, and this brings up the statement, often made, that cement manufacturers of our interior states are apathetic if not antagonistic to a protective tariff. This is not true. The only basis for this assertion is explained well in an article written by the vice-president of a Midwest company, C. B. Condon of The Hawkeye Portland Cement Company, Des Moines, Iowa. His article, directed to the agricultural industry and titled "How Farmers Will Bene-

fit From the Cement Tariff," contains much that should enlighten operators and workers in other industries. The following are excerpts which are intended to enlist the farmers' support of the pending tariff legislation, and which disprove the presumption that any sectional prejudices prevail among our cement manufacturers.

"Foreign cement never has affected and cannot affect prices in the interior, tariff or no tariff, because foreign cement cannot advantageously be shipped to agricultural sections. The freight on $10 worth of shoes, for example, is a minor factor in their cost to the consumer because the weight is so small compared with the cost. But with cement the reverse is true. For $10 at the mill, one gets not a pound or so of cement but a ton. Because of its heavy weight and low cost, the item of freight is a most important one in the delivered cost of cement. N. W. Richardson, representing the European cement makers opposed to the tariff on cement, testified under oath before the Senate committee that 'We can go only as far inland (with imported cement) as we can truck cement, generally, from the piers.'

"The correctness of his statement is indicated by the fact that, even without a tariff duty, the price of foreign cement plus the freight to interior points is much higher than American cement at the same points. If one takes at random the capitals of the central agricultural states — Indianapolis, Lansing, Springfield, Madison, Des Moines, Jefferson City and St. Paul, he finds that prices for American cement are from 42 cents to 87 cents a barrel lower or from $2 to $5 per ton lower than the price of duty-free foreign cement in New York plus the lowest commodity freight rate from New York to these interior points. Under these conditions it is clear that the proposed tariff would have no effect on the price of cement in the central agricultural section.

"Freight is so important a part of cement costs that high or low prices at the seaboard are not reflected in the interior. In the period from 1920 to 1924, when foreign cement did not disturb eastern American markets, government figures show that seaboard prices dropped a net of only 15 cents while inland prices dropped 28 cents; and during the period from 1925 to 1927 when foreign cement disturbed eastern markets, seaboard prices dropped 35 cents while interior prices dropped only 15 cents. A tariff on cement, therefore, and especially so small a tariff as proposed (8 cents per hundredweight) will have no influence either way on prices at which cement is sold in the agricultural states.

"Another reason why farmers of the midwest are assured of a continuance of minimum prices is found in the overproducing capacity of the industry and the resulting keen competition which keeps prices at low levels. For years plants have manufactured and sold only part of what they were able to produce. In spite of the increasing use of cement, producing capacity has increased much faster than the demand because of the erection of new plants and enlargement of existing plants. As a result, according to government figures for the year ending June 1, 1929, the American industry operated at only 70.2 per cent of its capacity. In short, the industry could make almost 50 per cent more cement than it sells. With manufacturers able to make much more cement than they can sell and keenly competing with each other for the existing business, and with prices governed by the law of supply and demand, low prices for the product inevitably follow. There is every assurance for believing that this condition, undesirable as it is from a manufacturer's viewpoint, will continue and that farmers will be able to buy cement at prices as low as, or lower than, those now prevailing. This holds true whether a tariff is adopted or not.

"In addition to enjoying a continuance of low cement prices under the tariff, farmers also will profit by the larger markets for their products which the tariff will insure. The United States Tariff Commission and the Ways and Means Committee of the House both found that importations of cement have forced 48 per cent of eastern seaboard mills to operate at a loss and to sell 80 per cent of their cement below cost of manufacture. On May 1, six large seaboard mills had shut down and many others have gone through long periods of suspension. Hundreds of workmen lost their jobs and, with their families, thousands of persons were affected. This situation, now existing among a few thousand, will steadily grow more acute with the increase of importations unless a tariff remedy is applied.

"Workmen in European cement plants receive about one-fourth the pay of employes in American plants. Their standards of living would be repugnant to Americans. Foreign cement, so produced, is shipped at negligible freight rates or as ballast in vessels coming to America and can be laid down at seaboard at a lower cost than American plants nearest these points can make and ship it there by rail. If American workmen generally were to receive the European wage—that is, one-fourth of their present pay—they would have to reduce their consumption of farm products and other things to a bare minimum.

"Enactment of the duty on cement, therefore, will benefit farmers by insuring better markets for their products through the maintenance of the buying power of consumers; it cannot affect cement prices in the agricultural states; and under it farmers are assured of a continuance of the present reasonable price levels."

Effect of Tariff on Cement Prices

On June 18, 1929, a statement of the cement situation, addressed to the Honorable Reed Smoot, chairman of the Finance Committee, United States Senate, was signed by representatives of approximately 94 independent companies holding 157 active plants in 32 states. This last item—the number of states represented—is significant. Numerous economic factors are discussed in this statement, but one of the sections deals solely with a point, raised frequently, to the effect that a tariff would not only protect the seaboard manufacturers but would promptly raise cement prices generally throughout the country. We quote:

"Cement is sold at a lower price per pound than any other highly manufactured commodity; it nets the manufacturer an average of less than one-half cent a pound.

"The claim that a price increase at seaboard can be carried back to inland points is an economic absurdity. The history of the cement industry clearly demonstrates that seaboard and inland cement price structures are independent.

"In order to assume that increased prices at seaboard would be reflected in increased prices at inland points, it would have to be shown that depressed prices at seaboard have been reflected in depressed prices inland. The fact is, as shown by government statistics (Mineral Resources of the United States, 1921-1927), inland prices have been least stable in years when seaboard prices were firm.

"The trend of cement prices has been consistently downward throughout the history of the industry. In inland as well as seaboard markets this general trend has been accompanied by sharp variations from time to time, due both to general and local economic conditions.

"If recent depressed prices at seaboard had affected prices inland, such effect on inland prices would be proportionate to the distance from seaboard. A study of cement prices for the years 1920 to 1927 shows that price reductions have frequently been greater at points far from seaboard than at points near seaboard.

"The following table compares the wholesale prices of portland cement delivered in carload lots as of December, 1926, and December, 1927 (Mineral Resources of the United States, 1927, Part II, Pages 269, 298, United States Department of Commerce):

City	Distance from New York	Net Change per bbl. (cents)
Kansas City, Mo.	1,331 Miles	—28
St. Paul, Minn.	1,307 "	—10
Davenport, Iowa	1,127 "	— 5
St. Louis, Mo.	1,053 "	—15
Indianapolis, Ind.	812 "	—10
Chicago, Ill.	903 "	— 5
Toledo, Ohio	701 "	No change

"If foreign cement should be brought to any of the above cities on favorable commodity rail rates, its delivered cost would be from 39 cents to $1.33 more than the price at which American cement is sold in these same cities. Under these conditions, it is obvious a tariff duty on cement cannot affect the price of cement in these cities.

"Dividing the years 1920-1927, inclusive, into two periods—the period in which foreign cement did not especially disturb seaboard markets, and that in which foreign cement did disturb seaboard markets, it will be seen that the price conditions at seaboard were in no wise reflected in price conditions inland. In the first period—1920 to 1924—seaboard prices dropped a net of only 15 cents, while inland prices dropped 28 cents; and in the second period—1925 to 1927—seaboard prices dropped precipitately, 35 cents, while inland prices not only remained firmer than seaboard, but firmer than they had been in the preceding period, dropping only 15 cents.

	Inland Price Change	Seaboard Price Change
1921	—18 cents	+ 3 cents
1922	—12 "	—20 "
1923	+14 "	+ 9 "
1924	—12 "	— 7 "
1925	— 2 "	—12 "
1926	— 8 "	—13 "
1927	— 5 "	—10 "

"During both periods the amount and sometimes the direction of price changes differed in each territory."

Is There a Cement Monopoly?

There is another angle to the American cement industry that we may consider here. We hear and read a great deal about the cement octopus—a monopolizing industry. Daily newspapers lend their columns to the tirade. Let us quote again from the same statement addressed to the United States Senate. Under the heading "Competition in the American Industry" one section reads:

"Reference has been made during discussion of the pending bill, to an alleged American cement trust or monopoly in restraint of trade. American cement is produced by approximately 94 independent companies, the largest of which produces approximately 10 per cent of the total. The aim and tendency of monopoly or restraint of trade is to increase prices by restraining or limiting production. Over a long period of years, prices for American cement have trended steadily downward and over capacity to produce has as steadily increased.

"The ratio of production to capacity for all American mills has dropped from 80 per cent in 1922 to 70 per cent in 1928. The average mill net return has ranged downward from $2.02 a barrel in 1920 to $1.60 in 1928.

"The United States Supreme Court in the so-called cement case in 1925 cleared the cement industry of any charge of monopoly or conspiracy in restraint of trade. That decision will be found in 268 U. S. 588. Since that decision there has been no change in the organization, practices, or marketing methods of the cement industry which in any way vitiate that vindication."

Other Pertinent References

Another assurance that cement operators of our interior states are backing the movement for a tariff is found in a recent statement by Charles Boettcher, Denver, president of several inland cement companies. He is reported as saying:

"Local conditions of supply and demand, therefore, will continue to control cement prices in western markets, and excess of supply over demand will continue to force low price levels.

"Action of the Senate committee definitely sets cement apart from the objections to tariff duties on other commodities which the farmer buys, whether such objections are well founded or not.

"It is to be hoped those seeking to make cement bear a share of this opposition will recognize the unfairness and unwisdom of such an attack on a basic industry, which both sectionally and nationally contributes many millions of dollars annually to the buying power of markets where the farmer must sell his products.

"If a duty is placed on cement, the farmer will lose nothing; if a duty is denied cement, he not only will gain nothing, but he will lose substantially through the resulting damage to his own markets."

And, from another angle, we note that what has been considered an antagonistic factor—the attitude of midwestern construction operators—is really a misapprehension. The *Chicago Tribune* says:

"Midwestern builders and farmers have nothing to fear from the establishment of an import duty on cement, according to a statement made yesterday by Oscar W. Rosenthal, president of the Builders' Association of Chicago and the Associated Building Contractors of Illinois, and also vice-president of the National Association of Building Trade Employes.

" 'Foreign cement cannot reach a market further than a truck haul from the harbor docks,' Mr. Rosenthal declared."

Americans to Present Papers at World Engineering Congress

Reservations have been made by over 200 engineers from all parts of the United States who intend to be present at the World Engineering Congress to be held in Toyko, Japan, in October and November, according to Maurice Holland, executive secretary of the American committee. Papers will be presented by many of these. Among the subjects to be covered are the following:

"The Rapid Transit Subways of New York City," by Robert Ridgway; "Municipal Engineering in the United States," by C. E. Grunsky; "River and Harbor Engineering in the United States," by Major General Edgar Jadwin; "Cement," by Thaddeus Merriman; "Public Health Engineering," by G. W. Fuller, H. P. Eddy and E. B. Phelps; "Ventilation of Vehicular Tunnels," by Ole Singstad; "Economic and Operating Considerations in Railroad Electrification in the United States," by Dugald C. Jackson, "Safety in Dam Construction," by Allen Hazen; and "Suspension Bridges," by Ralph Modjeski.

President Hoover has approved the appointment of seventeen delegates to represent the United States, as follows: Elwood Mead, director, U. S. Bureau of Reclamation; George Otis Smith, director, U. S. Geological Survey; George K. Burgess, director, U. S. Bureau of Standards; O. C. Merrill, formerly executive secretary, Federal Power Commission; Major General Edgar Jadwin, formerly chief of engineers; Scott Turner, director of the U. S. Bureau of Mines; Elmer A. Sperry, past-president, Am. Soc. M. E.; Frank B. Jewett and John W. Lieb, past-presidents, A. I. E. E.; John R. Freeman, past-president, Am. Soc. C. E.; Maurice Holland; Daniel L. Turner and Byron Eldred, consulting engineers; J. V. W. Reynders and John Hays Hammond, past-presidents, A. I. N. M. E.; Mark Requa, mining engineer, and Dugald C. Jackson, past-president, A. I. E. E.

The American Railway Engineering Association has named as its official representative at the congress Louis Yager, assistant chief engineer of the Northern Pacific Railway, who is president of the association.

New Singapore Railway

Plans for a new railway to be constructed on Singapore Island, known as the "deviation scheme," have been approved by the Government of the Federated Malay States, according to a report from Trade Commissioner Don C. Bliss, Singapore, in *Commerce Reports*. The work, which will extend over a period of approximately 2½ years, will, when completed, afford the city of Singapore 9¼ miles of additional railroad with provision for eventual double tracking; two new passenger stations, overhead bridges, and a terminal at the docks. The scheme has been prepared by the Construction Department of the Federated Malay States Railways, Singapore, which will execute the work partly on contract.

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the States to which cement was shipped during May and June, 1928 and 1929.

Portland cement shipped from mills into States in May and June, 1928 and 1929, in barrels

Shipped to—	May		June	
	1928	1929	1928	1929
Alabama	294,946	172,938	218,443	156,187
Alaska	588	1,641	1,179	1,564
Arizona	23,982	57,318	45,357	76,157
Arkansas	120,605	98,331	94,530	148,867
California	1,101,338	977,113	1,135,923	981,611
Colorado	122,205	106,513	134,040	105,289
Connecticut	273,367	202,140	274,577	192,236
Delaware	35,361	35,091	31,076	45,544
District of Columbia	66,508	109,581	77,565	110,735
Florida	90,435	105,045	101,132	91,891
Georgia	167,422	121,684	151,318	117,598
Hawaii	29,807	32,262	19,441	22,254
Idaho	35,009	35,169	31,940	31,802
Illinois	2,087,924	1,583,290	1,921,820	1,780,688
Indiana	568,668	474,599	513,118	635,341
Iowa	929,356	579,190	790,414	728,393
Kansas	250,076	258,378	203,747	229,267
Kentucky	178,020	146,423	155,438	164,656
Louisiana	110,257	121,576	107,624	111,922
Maine	49,458	56,851	69,190	65,594
Maryland	250,926	235,589	240,228	244,635
Massachusetts	306,685	303,692	314,595	293,455
Michigan	1,218,783	1,192,634	1,393,059	1,486,439
Minnesota	446,443	348,850	490,086	456,148
Mississippi	89,421	79,718	90,654	73,313
Missouri	473,066	436,246	388,090	567,722
Montana	50,054	76,909	57,263	82,861
Nebraska	131,720	140,036	132,088	152,570
Nevada	11,050	16,672	10,583	14,091
New Hampshire	48,034	70,122	52,334	73,359
New Jersey	899,439	890,487	836,204	909,551
New Mexico	30,612	28,894	32,989	32,003
New York	2,414,892	2,130,573	2,369,486	2,493,401
North Carolina	259,658	222,453	253,034	179,570
North Dakota	69,986	58,414	89,107	81,746
Ohio	1,263,450	990,025	1,111,149	1,192,848
Oklahoma	307,249	270,643	271,078	286,697
Oregon	143,000	94,249	132,565	95,717
Pennsylvania	1,396,046	1,296,266	1,303,841	1,467,886
Porto Rico	500	300	.....	2,800
Rhode Island	93,304	80,975	81,651	72,067
South Carolina	141,083	139,561	174,819	123,954
South Dakota	65,137	54,123	81,989	64,846
Tennessee	274,229	248,286	231,638	348,983
Texas	601,278	622,377	563,118	675,511
Utah	38,520	67,602	50,931	59,003
Vermont	43,912	83,862	67,482	130,517
Virginia	201,315	190,663	198,998	186,036
Washington	315,209	208,716	342,740	244,546
West Virginia	151,015	115,718	126,545	153,996
Wisconsin	615,376	633,405	728,674	786,307
Wyoming	18,033	20,364	22,174	27,961
Unspecified	27,702	0	36,666	14,081
	18,932,459	16,623,557	18,353,730	18,872,216
Foreign Countries	53,541	82,443	67,270	69,784
Total shipped from cement plants	18,986,000	16,706,000	18,421,000	18,942,000

Production, shipments, and stocks of finished Portland cement, by districts, in July, 1928 and 1929, and stocks in June, 1929 (In thousands of barrels)

District	July						Stocks at end of June
	Production		Shipments		Stocks at end of month		
	1928	1929	1928	1929	1928	1929	1929
Eastern Pa., N. J. and Md	3,832	3,709	4,042	4,171	5,913	5,389	5,852
New York and Maine	1,207	1,366	1,428	1,609	1,622	1,766	2,009
Ohio, Western Pa. and W. Va	1,843	2,075	2,172	2,246	3,096	3,378	3,550
Michigan	1,662	1,432	1,872	1,964	1,748	1,937	2,469
Wis., Ill., Ind., and Ky	2,375	2,354	2,863	2,837	2,506	3,168	3,650
Va., Tenn., Ala., Ga., Fla. and La	1,414	1,216	1,419	1,520	1,867	1,759	2,063
Eastern Mo., Ia., Minn. and S. Dak.	1,736	1,569	2,323	2,223	2,554	3,092	3,745
Western Mo., Neb., Kans., and Okla.	1,027	1,159	1,227	1,382	1,370	1,269	1,492
Texas	561	701	603	666	314	546	510
Colo., Mont., Utah, Wyo. and Idaho	260	322	291	299	456	529	506
California	1,124	991	1,192	994	752	991	995
Oregon and Wash	433	322	469	362	392	548	587
	17,474	17,216	19,901	20,273	22,580	24,372	27,428

Production, shipments, and stocks of finished Portland cement, by months, in 1928 and 1929. (In thousands of barrels)

Month	Production		Shipments		Stocks at end of month	
	1928	1929	1928	1929	1928	1929
January	9,768	9,881	6,541	5,707	25,116	26,797
February	8,797	8,522	6,563	5,448	27,349	29,870
March	10,223	9,969	10,135	10,113	27,445	29,724
April	13,468	13,750	13,307	13,325	27,627	30,151
May	17,308	16,151	18,986	16,706	25,984	29,597
June	17,497	16,775	18,421	18,942	25,029	27,428
July	17,474	17,216	19,901	20,273	22,580	24,372
August	18,759	.....	21,970	.....	19,374	.....
September	17,884	.....	20,460	.....	16,799	.....
October	17,533	.....	19,836	.....	14,579	.....
November	15,068	.....	11,951	.....	17,769	.....
December	12,189	.....	7,384	.....	22,650	.....
	175,968	.....	175,455	.....	.....	.....

Cement Statistics for July 1929

The portland cement industry in July, 1929, produced 17,216,000 barrels, shipped 20,273,000 barrels from the mills, and had in stock at the end of the month 24,372,000 barrels, according to the United States Bureau of Mines, Department of Commerce. The production of Portland cement in July, 1929, showed a decrease of 1.5 per cent and shipments an increase of 1.9 per cent, as compared with July, 1928. Portland cement stocks at the mills were 7.9 per cent higher than a year ago.

The statistics here presented are compiled from reports for July, from all manufacturing plants except two for which estimates have been included in lieu of actual returns.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 163 plants at the close of July, 1929, and of 158 plants at the close of July, 1928. In addition to the capacity of the new plants which began operating during the twelve months ended July 31, 1929, the estimates include increased capacity due to extensions and improvements at old plants during the period.

New Corporations.

Republic Portland Cement Co., San Antonio, Tex. 250,000 com. n.p.v. and $1,250,000. J. H. Smith, A. F. Sayers, J. W. Young.

Gypsum Products Sales Corp., Richard B. Constantine, 85 Devonshire St., Boston, Mass. 500 shares n.p.v.

Catsman Sand & Gravel Co., 814 W. Second St., Flint, Mich. $50,000. Philip Catsman, Samuel M. Catsman. (Previously reported as Oatsman Sand & Gravel Co.)

Cumberland River Sand Co., Ft. of Fatherland St., Nashville, Tenn. 3,500 shares, $100 each; 12,000 shares n.p.v. John M. Settle, James H. Duffy, Thomas G. Watkins.

Superior Sand & Gravel Co., c/o H. D. Fisk, First Nat. Bk. Bldg., De Kalb, Ill. 500 shares n.p.v. T. E. Courtney, P. W. Fisk, John C. Killian.

Hyde Park Quarries, Inc., c/o John J. Shay, attorney, 81 Strathmore Road, Brighton, Mass. $500,000.

Fred-Onio Fluorspar Co., c/o Corp. Trust Co. of Del., Dover, Del. 2,400 shares com.

Consolidated Graphite Corp., c/o Cutting, Moore & Sidley, M. O. West, 11 S. LaSalle St., Chicago, 100,000 shares.

East Tennessee Marble Co., Powder Springs, Tenn. $250,000. W. A. Cockrum, Pres.; Howard Edelen, V. P.; W. J. Sterchi, 2nd V. P.; C. R. Fielden, Sec.-Treas.; C. K. Vance, G. T. Fielden, Whiting Newell, Directors.

American Sand & Material Co., St. Louis, Mo. 500 shares, n.p.v. $10,000. Reuben F. Koch, 249 shares com.; Leo. H. Hummert, 249 shares com.; D. A. Boyd, same. J. V. Dunbar, Att'y., 317 N. 11th St., St. Louis, Mo.

Midland Sand Company, Tulsa, Oklahoma. $3,000. W. E. Davis, John Detamore and T. Dahlstrom.

Jonesville Gravel Company, Ft. Wayne, Ind., 600 shares, $100 each, and 300 shares, n.p.v. John F. Brooks, Lester E. Ginn and L. E. Marsh, directors.

Phosphate Supply Adequate

American production of phosphate rock in 1927 was more than 3,000,000 tons, with a total market value of over $11,000,000, out of a total world production of about 10,000,000 tons, reports a recent issue of the Industrial Bulletin of Arthur D. Little, Inc. In 1927 about 30 per cent of the American production was exported, 90 per cent of the remainder being worked up for fertilizer and the rest used in the manufacture of phosphorus and chemicals.

Although the quantity of phosphatic materials used for other purposes than fertilizers is relatively small, such uses are nevertheless rapidly growing in importance. Phosphoric acid is now being produced directly from phosphate rock in electric furnaces. It promises to displace sulphuric acid from certain industrial uses in which a phosphatic byproduct would find a market as a fertilizer.

Fortunately the United States possesses almost unlimited reserves of phosphate rock. Deposits in Idaho, Utah and Wyoming are said to contain several billion tons, as yet practically untouched. The great deposits in the Southern states should last for several generations. There is great need for improvement in the mining processes. In most of the fields, the phosphate rock occurs as pebbles in the beds of ancient water courses intermixed with chalky or sandy material. It has usually been mined by a simple washing process, which saved only the coarser pebbles. The rejected fines contain sometimes more than 50 per cent phosphate, and millions of tons of rich material go to waste.

Exports and Imports

Compiled from the records of the Bureau of Foreign and Domestic Commerce and subject to revision.

Exports of hydraulic cement by countries in June, 1929

Exported to—	Barrels	Value
Canada	8,172	$33,919
Central America	17,581	45,685
Cuba	23,676	44,092
Other West Indies and Bermuda	8,969	22,282
Mexico	14,559	38,862
South America	18,644	77,335
Other countries	4,454	25,437
	96,055	287,612

Imports of hydraulic cement by countries and by districts, in June, 1929

Imported from—	District into which imported	Barrels	Value
Belgium	Connecticut	1,500	$1,547
	Galveston	6,000	6,974
	Los Angeles	44,680	23,222
	Massachusetts	44,161	58,325
	New Orleans	5,947	7,228
	New York	10,387	13,286
	North Carolina	22,115	27,237
	Oregon	3,000	3,190
	Philadelphia	27,030	38,196
	Porto Rico	112	273
	Total	164,932	179,478
Canada	Alaska	8	36
	Maine and New Hampshire	792	1,774
	Total	800	1,810
Denmark	New York	18,146	18,997
	Porto Rico	13,835	18,509
	Total	31,981	37,506
France	New York	1,250	2,488
	San Francisco	75	124
	Total	1,325	2,612
Germany	Los Angeles	2,875	4,515
	San Francisco	125	246
	Total	3,000	4,761
United Kingdom	Philadelphia	1,507	2,003
	Grand Total	203,545	228,170

Exports and imports of hydraulic cement, by months, in 1928 and 1929

	Exports				Imports			
	1928		1929		1928		1929	
Month	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
January	56,400	$204,875	78,639	$283,002	236,771	$315,797	151,302	$177,976
February	62,828	221,620	58,886	225,590	164,408	217,525	118,930	123,123
March	74,983	265,719	69,079	235,164	235,930	330,074	131,909	112,788
April	61,676	205,882	64,145	218,316	249,458	324,371	89,668	114,281
May	70,173	236,005	57,955	219,366	190,509	256,872	200,646	267,854
June	59,536	201,313	96,055	287,612	266,537	359,637	203,545	228,170
July	83,759	291,055	.....	.....	112,887	151,877	.....	.....
August	88,736	302,866	.....	.....	259,975	358,471	.....	.....
September	71,995	252,843	.....	.....	173,439	226,295	.....	.....
October	62,137	246,010	.....	.....	152,210	226,909	.....	.....
November	69,313	260,310	.....	.....	65,969	89,732	.....	.....
December	63,120	250,204	.....	.....	175,992	233,300	.....	.....
	824,656	2,938,702	.....	.....	2,284,085	3,090,860	.....	.....

Domestic hydraulic cement shipped to Alaska, Hawaii, and Porto Rico, in June, 1929

	Barrels	Value
Alaska	2,044	$6,156
Hawaii	23,220	57,798
Porto Rico	805	2,633
	26,069	66,587

Production and stocks of clinker (unground cement), by districts, in July, 1928 and 1929. (In thousands of barrels)

District	Production		Stocks at end of month	
	1928	1929	1928	1929
Eastern Pa., N. J. and Md.	3,662	3,314	1,840	2,003
New York and Maine	1,159	1,108	963	1,014
Ohio, Western Pa., and W. Va.	1,537	1,712	1,663	1,284
Michigan	1,310	1,287	1,357	1,034
Wis., Ill., Ind., and Ky.	1,984	1,851	1,139	1,591
Va., Tenn., Ala., Ga., Fla., and La.	1,385	1,084	966	1,020
Eastern Mo., Ia., Minn. and S. Dak.	1,628	1,411	812	869
Western Mo., Neb., Kans. and Okla.	1,039	1,072	580	624
Texas	561	652	102	188
Colo., Mont., Utah, Wyo. and Idaho	229	252	373	459
California	1,096	1,122	1,371	1,010
Oreg. and Wash.	391	255	541	511
	15,981	15,120	11,707	11,607

INSURANCE PROBLEMS DISCUSSED

Marine Insurance

Marine insurance covers more than ships. From the standpoint of insurance the property owned by sand and gravel producers falls into three classes. The first of these, buildings, is subject to the well-known forms of protection against loss from fire, wind, explosion and so on. The other two (floating property, such as boats, barges and dredges, and movable land equipment, such as derricks and steam shovels) are both covered by marine insurance. A more general name for this field of indemnity might be devised, since it covers anything that is not fixed in location, but the name marine insurance or "floater policies" have been accepted for protection on both land and water.

Much of the floating property in our industries is soundly covered by insurance. However, the market for this indemnity is rather limited, and as a result there are some producers who have no access to good information and there are others who have difficulty in securing satisfactory protection. Two general agencies, in fact, handle a large proportion of the coverage in this field, but these firms will deal with local insurance men in all parts of the country, and therefore if you believe you might improve your present policies, your regular agent or broker can locate full information about the available market.

The first step in buying marine insurance is to study the risks to which your property is subject. Every vessel can be destroyed or at least damaged by fire. Most dredges and boats are wood, and even all-steel barges can be materially damaged by fire on an adjoining ship or dock. Then there are the exclusively water risks of sinking, stranding and collision. These risks are so severe in our industry, where operations are commonly carried on near shore, that insurance companies are cautious about accepting business, but if your broker looks far enough among the many possible insurers you can almost certainly get full protection for craft on any navigable body of water.

Inland Lakes

One of the hardest problems is the insuring of dredges and other floating equipment on small inland lakes or ponds. Often the operation of the equipment itself causes sand bars or changes the contour of the lake bottom so that stranding is almost inevitable. Marine underwriters will not touch business of this sort, but the regular fire companies will write policies covering the risks of fire and windstorm only. This limited protection is ordinarily sufficient. Stranding in a small lake seldom causes more than minor damage, but fire can destroy property wherever it is located. The distinction between fire insurance companies and the marine underwriters is important in this connection, because you can advise your broker or agent that he has two entire fields in which to get satisfactory protection.

Liability for Damage

Vessels, like automobiles, can injure the persons or property of others. In the case of the automobile we have come to recognize that liability for accidents is the biggest risk and that a motorist can more safely lose his car through fire or theft than face the uncertainties of a jury trial for personal injuries. The legal liability for catastrophes on the water differs somewhat from that governing automobile accidents. While automobile cases go into local courts, collisions on navigable water come under the Federal law, which in turn follows the international rules of the sea that have been developed over centuries. On the one hand marine law puts certain limits to the liability of a vessel owner, but also it defines his responsibilities so clearly that there is little chance of evading them. Liability insurance is therefore quite desirable for every dredge or vessel on a lake or river. In marine language this is called "protection and indemnity." Some brokers speak carelessly of the policy covering loss of one's own craft through fire, sinking, stranding or collision as being full coverage, and so you must bear in mind yourself that your insurance is not complete unless you have a second policy for "protection and indemnity."

Steam Shovels

Movable equipment on land offers a problem of insurance that is new to a great many producers. Some folks think that unless equipment can be classed as a building or a boat it cannot be covered, and they needlessly carry their own risk on valuable machines. Steam shovels, derricks and similar machines represent a big investment, and insurance covering loss or damage to these is readily obtainable from marine companies under the form commonly known as contractors' equipment insurance.

The policy on movable equipment covers all loss or damage from fire, collision, derailment, cyclone, tornado, flood and collapse of bridges, these being practically all of the kinds of casualty that are at all probable. The cost of protection is determined by a scientific rating schedule. Following is the schedule used by several of the largest insurance companies, which is typical of the method of fixing charges:

Rates per $100 of Value

Basic rate	$1.50
For sand and gravel pit equipment	Add .50
Machines other than all metal	Add .25
Machines operated in flood areas	Add .35
Machines operated in tornado belts	Add .15
Gasoline fuel-steel machines	Add .25
Gasoline fuel-machines with wood houses	Add 1.00
Theft coverage	Add .50

In summary it should be noted that marine losses are much more often pure accidents than those covered by other lines of insurance. Workmen can be trained in a shop so thoroughly that personal injuries are almost eliminated, and factory fires can be generally prevented by the practice of regular inspections and safety measures. But accidents to movable property, whether ashore or afloat, arise from circumstances that are entirely unforeseen. They can seldom be prevented from happening, and it is therefore especially important that the resulting financial loss should be covered by insurance.

Old Quarries Reopened

The quarries of the Dayton Limestone Company reopened recently on the Union road west of Dayton, O., are a scene of constant activity. Those quarries are under the management of G. E. Short, and A. D. Angelo with offices located at 2315 Lakeview Ave. The company is now in position to supply crushed stone, lime and building stone.

At the quarries, it taps some excellent rocks that are usable for road bed and lime manufacture.

Gypsum to Remain on Free List

After considerable debate the Senate finance committee left crude gypsum on the free list and retained the present duty of $1.40 on the ground product.

FROM THE FINANCIAL ANGLE

Current Dividends

Under this heading, PIT AND QUARRY will endeavor to publish, in each issue, a current list of dividend declarations. The following, being our initial list, contains some items that are a month or more old but hereafter the figures will be up-to-date. We will appreciate notification of any omissions or errors.

Rhodes-Jamieson Co. Retires Entire Funded Debt

The Rhodes-Jamieson Company, dealer in building materials and fuel, with headquarters in Oakland, California, has recently announced retirement of its entire outstanding bonded indebtedness, aggregating about $340,000 at a premium of 2½ per cent, on September 1, 1929. The bonds outstanding are first closed mortgage 7 per cent serial issue of $1,000 and $5,000 denominations. The American Trust Company is trustee.

The Company, which recently became a unit of Pacific Coast Aggregates, a consolidation of forty-six sand, rock and gravel companies, had $575,000, 7 per cent cumulative preferred and $1,000,000 common stock outstanding.

United States Gypsum Decline

The United States Gypsum Company and subsidiaries reported for the six months ended June 30, 1929, net income of $2,329,244 after depreciation, federal taxes, etc.; equivalent after 7 per cent preferred dividend requirements, to $2.70 a share (par $20) earned on 765,027 shares of common stock. This compares with $3,334,487 or $4.42 a share on 691,502 common shares in the first half of 1928.

Consolidated balance sheet as of June 30, 1929, shows current assets of $15,545,294 and current liabilities of $4,016,596, comparing with $16,988,-603 and $2,230,184, respectively, on June 30, 1928. Profit and loss surplus amounted to $28,832,153 this year against $26,774,030 last.

The information contained in these financial pages is given with the understanding that any statement on the part of this magazine or any of its staff or of the writer, as to the responsibility or standing of any person, firm or corporation, or as to the value of any property or securities is a mere expression of opinion, given as a matter of service to the readers of Pit and Quarry, for which no responsibility in any way is to attach to this magazine or to any of its staff.

Company	Class of stock	Dividend rate	Holders of record	Payable
Alpha Portland Cement	pre.	1¾% q.	June 1	June 15
Alpha Portland Cement	com.	$.75 q.	June 25,	July 15
American Aggregates Corp	pre.	1¾% q.	June 20	July 1
American Aggregates Corp	com.	$.75 q.	Feb. 20	Mar. 1
American Brick Company	pre.	$.50 q.	July 25	Aug. 1
Asbestos Corp., Ltd	7% pre.	Last quarterly dividend 1¾%		
Jan. 15, 1929. April and July dividends passed.				
Associated Portland Cement Mfrs., Ltd., American depository receipts for ordinary shares, 8% paid on March 16, 1929.				
Atlas Portland Cement	pre.	$.66⅔ q.	June 21	July 1
Atlas Portland Cement	com.	$.50 q.	Aug. 16	Sept. 3
Bessemer Limestone & Cement	Class A	$.75 q.	July 20	Aug. 1
Bessemer Limestone & Cement	Class B	$2.50	Jan. 20	Feb. 1
Bloomington Limestone Co	pre.	1¾% q.		April 1
Bloomington Limestone Co	com.	$.07½		Nov. 1
Boston Sand and Gravel	pre.	$.87½ q.	June 22	July 1
Boston Sand and Gravel	com.	$.40 q.	June 22	July 1
Calaveras Cement Co	7% pre.	1¾% q.	June 30	July 15
Canada Cement	pre.	1⅝% q.	May 31	June 29
Canada Gypsum and Alab		$.75 q.	June 15	July 2
Canada Paving and Supply	1st pre.	1¾% q.	May 15	June 1
Cleveland Graphite Bronze Co		$.25 q. plus .25 extra	June 25	July 1
Cleveland Quarries		$.50 q.	Aug. 15	Sept. 1
Cleveland Quarries		.25 extra	May 15	June 1
Consolidated Oka. Sand & Gravel	pre.	1¾% q.	June 27	July 2
Consolidated Rock Products	pre.	$.43¾	May 15	June 1
Consolidated Sand & Gravel	pre.	1¾% q.	July 31	Aug. 15
Construction Materials	$3.50 pre.	$.87½ q.	July 19	Aug. 1
Continental Clay Products	July 1, 1929, dividend passed			
Coronet Phosphate Co		1%	June 15	July 1
Dolese and Shepard		$2 q.	June 20	July 1
Dufferin Paving & Crushed Stone, Ltd	7% 1st pre.	2 33/100%	June 15	July 1
General Asphalt Co	pre.	1¼% q.	May 15	June 1
General Refractories Co	com.	$.75 q. plus .50 extra	Aug. 12	Aug. 26
Giant Portland Cement	pre.	$1.75 S	June 3	June 15
Ideal Cement Co	com.	$.75 q.	June 15	July 1
Illinois Brick		$.60 q.	Oct. 3	Oct. 15
Indiana Limestone	pre.	1¾% q.	May 20	June 1
Indiana Limestone	pre.	1¾% q.	Aug. 20	Sept. 1
International Cement	com.	$1 q.	June 11	June 28
International Salt Co		1½ %	June 15	July 1
Johns Manville Corp	com.	$.75 q.	Sept. 24	Oct. 15
Johns Manville Corp	pre.	1¾% q.	Sept. 10	Oct. 1
Kelley Island Lime and Tr		$.62½ q.	June 20	July 1
Kentucky Cons. Stone Co	pre.	1¾% q.	July 15	Aug. 1
Kentucky Rock Asphalt Co	com.	$.40 q.	June 15	July 1
Kentucky Rock Asphalt Co	com.	5% stock div.	Apr. 1	Apr. 15
Kentucky Rock Asphalt	pre.	1¾% q.	Aug. 15	Sept. 3
Laclede Christy Clay Prod	pre.	1¾% q.	June 29	July 1
Laclede Christy Clay Prod	com.	*$1.25 q.	July 22	Aug. 1
*Increased from $.75 quarterly.				
Lawrence Portland Cement Co		2% q.	June 15	June 29
Lehigh Portland Cement Co	pre.	1¾% q.	June 14	July 1
Lehigh Portland Cement Co	com.	$.62½ q.	July 13	Aug. 1
Lehigh Portland Cement Co	pre.	1¾% q.	Sept. 14	Oct. 1
Limestone Products	7% pre.	1% q.	June 15	July 1
Material Service Corp		$.50 q.	May 15	June 1
McNeel Marble Co	pre.	1½% q.	April 8	April 15
Medusa Portland Cement	com.	$1.50 q.	June 25	July 1
Metropolitan Paving Brick	pre.	1¾% q.	June 15	July 1
Metropolitan Paving Brick	com.	$.50 q.	May 15	June 1
Metropolitan Paving Brick	pre.	1¾% q.	Sept. 15	Oct. 1
Metropolitan Paving Brick	com.	$.50 q.	Aug. 15	Sept. 1

Company	Class of stock	Dividend rate	Holders of record	Payable
Missouri Portland Cement		$.50 q.	July 19	Aug. 1
Monolith Portland Cement	pre.	$.40 S	June 14	July 1
Monolith Portland Cement	com.	$.40 S	June 14	July 1
National Brick Co. of Laprarie	6% pre.	$.75 q.	May 31	June 15
National Brick Co., Ltd	pre.	1½% q.	Jan. 31	Feb. 15
Newago Portland Cement	7% pre.	1¼% q.		June 30
North American Cement	pre.	*1¾%	July 15	Aug. 1
Okonite Co	pre.	1¾%	Aug. 20	Sept. 3
Pacific Clay Products		$.60 q.	July 20	Aug. 1
Pacific Lime Co., Ltd	pre.	$1.75 q.		April 1
Pacific Portland Cement	pre.	1⅝% q.	June 29	July 5
Peerless Egyptian Cement	pre.	1¾% q.	June 20	July 1
Penn-Dixie Cement	pre.	1¾% q.	Aug. 31	Sept. 15
Raybestos Co	8% pre.	2% q.	June 15	July 1
Raybestos Co	com.	$.80 q.	June 15	July 1
Riverside Cement	1st pre.	$1.50 q.	July 15	Aug. 1
Riverside Cement	Class A, partie	$.31¼ q.	July 15	Aug. 1
Rockland & Rockport Lime	1st pre.	Aug. 1, 1928, dividend passed		
Santa Cruz Portland Cement		$1.00 q.	June 21	July 1
Southern Asbestos	com.	$1.25 plus .25 extra		
			July 9	July 15
Standard Clay Products	com.	2%	Jan. 31	Feb. 15
Standard Paving and Material, Ltd	7% pre.	1¾% q.	Aug. 2	Aug. 15
Standard Paving and Material, Ltd	com.	$.50 q.	Aug. 2	Aug. 15
Sterling Salt Co	com.	$.50 q.	June 24	July 1
Superior Portland Cement	Class B	$.25 q.	June 15	June 20
Superior Portland Cement	Class A	$.27½ M.	Aug. 23	Sept. 1
Texas Gulf Sulphur	(no par)	$1.00 q.	Sept. 2	Sept. 16
United States Asbestos Co	pre.	1¾% q.	Apr. 20	May 1
United States Asbestos Co	com.	$.75 q.	July 22	Aug. 1
United States Gypsum Co	pre.	1¾% q.	Sept. 14	Sept. 30
United States Gypsum Co	com.	$.40 q.	Sept. 14	Sept. 30
Virginia Carolina Chem	prior pre.	1¾% q.	Aug. 17	Sept. 1
Warner Company	1st pre.	$7 cum. $1.75 q.	June 20	July 1
Warner Company	com.	$.50 q.	June 29	July 15
Wolverine Portland Cement		$.15 q.	Aug. 5	Aug. 15
Worcester Salt Co	pre.	1½% q.	May 11	May 15
Worcester Salt Co	com.	1¼% q.	June 24	June 29
Worcester Salt Co	pre.	1½% q.	Aug. 10	Aug. 15

*Last previous payment 1¾% Aug. 1, 1928.

Raybestos-Manhattan

A report by Raybestos-Manhattan, Incorporated, and subsidiaries for six months ended June 30, 1929, showed a consolidated net income of $2,098,530 after charges and federal taxes, equivalent to $3.10 a share on the 676,012 no-par shares of common stock to be outstanding as the sole capitalization of the corporation which represents the recent merger of the Raybestos Company, the Manhattan Rubber Manufacturing Company and the United States Asbestos Company.

In the first six months of 1928 the aggregate net income of the three companies, without allowing for intercompany adjustments, was approximately $1,286,000 equal to $1.90 a share on the capitalization of the present merged company.

Consolidated income account for six months ended June 30, 1929, follows:

Net sales	$12,215,847
Costs and expenses	9,676,258
Operating profit	$ 2,539,589
Other income	172,163
Total income	$ 2,711,752
Depreciation	312,719
Federal taxes	300,503
Net income	$ 2,098,530
Preferred dividends	41,399
Common dividends	639,876
Surplus	$ 1,417,255

Consolidated balance sheet of Raybestos-Manhattan, Incorporated, and subsidiaries as of June 30, 1929, follows:

Assets

Land, bldg., machinery and equipment, after depreciation	$ 7,448,013
Trademarks, goodwill, etc.	595,157
Cash	1,921,921
Call loans	800,000
U. S. Government certificates of indebtedness	199,437
Municipal bonds	200,000
Marketable securities	82,152
Notes and trade acceptances receivable	321,708
Accounts receivable	2,640,038
Inventories	4,569,125
Investments and advances	507,330
Sundry accounts receivable	136,575
Deferred charges	63,487
Total assets	$19,484,943

Liabilities

Capital stock (represented by 676,012 no-par shares)	$ 9,721,800
Accounts payable	939,245
Accrued federal and state taxes	186,826
Provision for federal and state taxes for 1929	300,504
Contingent reserves	425,000
Surplus	7,911,568
Total liabilities	$19,484,943

Talk of Junior Dividend for General Asphalt

In the August 14 issue of PIT AND QUARRY we published a very encouraging earnings report of General Asphalt Company for six months ended June 30.

Now with a continuation of better demand for roofing and paving and the absence of losses in the refrigerator business, the monthly profits of this company are understood to be on a rapidly rising scale. As was stated in that report the second half of the year usually turns in the larger portion of the year's net so that it is confidently expected that this period will show a substantial improvement over the $1.41 a share on the 210,614 common shares reported for the first half-year.

With monthly net continuing to make substantial gains, June alone being reported to have been around $275,000, it is believed that the common stockholders may finally be in line for a distribution. The junior shareholders have never yet received a dividend payment. More than a year ago the subject of dividends was under discussion but adverse development in fuel oil market and losses in refrigerator business changed the outlook.

The income from Asphalt's royalty oil in Venezuela is not up to normal, due to low fuel oil prices. Any improvement in the price of this commodity would aid Asphalt's profits materially. Next year its royalty oil should be considerably increased as the new 20,000-bbl. pipe line of the Colon Oil Company to the Tarra field will start deliveries.

Aside from its junior stock, Asphalt has $6,608,200 of preferred and $4,205,800 of bonds. Both issues are convertible into common stock.

Pennsylvania-Dixie Cement Corporation

A recently published report of the Pennsylvania-Dixie Cement Corporation for the twelve months ending June 30 and including subsidiaries may prove interesting to our readers.

A consolidated income account, compared with one ending June 30, 1928, is given below.

	1929	1928
Operating income	$ 3,232,507	
Depreciation and depletion	1,362,934	
Net after depreciation and depletion	1,869,573	$ 2,316,326
Federal taxes	179,329	955,393
Interest	714,431	
Net income	975,813	1,360,933
	Earned per share*	
$7 pfd. stock	$7.18	$10.02
Common stock	0.06	1.02

* Based on 135,888 preferred and 400,000 common shares. Approximate price (N. Y. S. E.) Preferred, $59.00; Common, $12.00.

Comparative Consolidated balance sheet, June 30 (including subsidiaries):

	1929	1928
Assets		
Land, bldg., equip., etc. (less depreciation)	$25,735,348	$25,311,576
*Pyramid Portland Cement		1,305,507
Investments, misc.	84,100	118,600
Insurance fund	35,000	35,000
Deferred charges	106,926	93,855
Current Assets		
Cash	1,402,878	965,791
Notes and accounts receivable	1,374,257	1,879,046
Inventories	3,432,435	2,951,486
Total current assets	$ 6,209,570	$ 5,796,323
Total assets	$32,170,944	$32,660,861
Liabilities		
Preferred stock	$13,588,800	$13,588,800
[1] Common stock	4,000,000	4,000,000
Funded debt	11,792,000	11,941,960
Misc. resources	197,564	42,022
Profit and Loss surplus	1,853,388	1,720,112
Current Liabilities		
Accounts payable	152,515	[2] 676,816
Accruals	380,300	429,974
Tax reserve	206,377	261,177
Total current liabilities	$ 739,192	$ 1,367,967
Total liabilities	$32,170,944	$32,660,861
[3] Net working capital	$ 5,470,378	$ 4,428,356

* Entire capital stock and properties.
[1] Represented by 400,000 no-par shares.
[2] Includes notes payable.
[3] Based on current assets and current liabilities as above.

The balance sheet dated June 30, 1929, indicated total book value of $6,050,952, including reserves of $197,564, applicable to the 400,000 no-par common shares, or $15.12 per share, as compared with $14.41 per share on June 30, 1928.

A recent report published by Dow-Jones and Company, stated that because of lower cement consumption in district served during the six months ended June 30, 1929, the preferred dividend was barely earned during that period. In the first half of the current calendar year adverse weather conditions and a lessening in general building activities, the latter caused in part by less favorable credit conditions, unfavorably affected production.

All this has caused concern over the possibility that the dividend may be passed at the forthcoming dividend meeting. It is understood that the desire of the majority of the directorate is to maintain this dividend just as long as earnings cover its requirements. Therefore, it would seem that a decision on dividends hinges entirely on the trend of current earnings which in the past six months have been unmistakably downward.

In common with other large cement companies, Penn-Dixie has suffered keenly during the past two and one-half years from importation of foreign cement, mainly from Belgium.

An official of the company was quoted recently as follows: "Lack of tariff protection against foreign cement importation continues serious, not only as to tonnage lost but particularly in respect to effect on domestic prices. Protection of eight cents a hundred pounds granted in the House Tariff Bill is inadequate and every effort is being made by the cement industry to convince the Senate of the seriousness of conditions and the justice of the industry's request for adequate protection."

However, Penn-Dixie is in good financial position as the common dividend was first reduced and then passed in October 1928 to prevent impairment of its financial position.

Cash on hand on June 30 amounted to $1,402,878 which was substantially in excess of all current liabilities.

Canada Gypsum and Alabastine, Limited, Acquires Two Companies

The Financial Counsel of Montreal recently stated that it had been informed that negotiations had been concluded for the acquisition, by the Canada Gypsum and Alabastine, Limited, of Standard Lime Company at Joliette, which owned lime manufacturing plants at Joliet and St. Mark, Quebec, and in turn controlled Lime Products, Limited, which operated a sand lime manufacturing plant at Montreal and also Standard Sand, Limited, of Montreal which operated a large sand pit at St. Felix, supplying building material to the market in Montreal and vicinity.

This acquisition will undoubtedly increase the earning capacity of the company and should bring their sales to well over the seven million dollars mark annually, and their earnings in excess of $1,000,000 a year.

Canada Gypsum will now maintain practically a monopoly of the gypsum business in the Dominion and the deal will, in addition, make the new concern of outstanding importance in the sand-lime brick business in the east.

Canada Cement Company, Limited

On August 14, 1929, Montreal advices said that the Canada Cement Company, Limited, had taken over the National Cement Company at Montreal East, through the purchase of a controlling interest from Alfred Rogers and Associates of Toronto. No announcement was made of the amount involved in the deal.

LEGAL INFORMATION FOR OPERATORS

The Law of Sand and Gravel Sales by Samples

The law is well settled that under ordinary circumstances a seller is bound to deliver merchandise to a buyer equal in quality to the samples shown when the sale was made.

The outcome of many litigations involving sales of sand and gravel made by samples, however, often is dependent upon whether the merchandise is sold f. o. b. the buyer's location or f. o. b. the seller's distributing point.

Another question which often arises is: Did the buyer have ample opportunity to inspect the material when the sale was made by the samples? Also, in many instances, a purchaser may unwisely attempt to avoid accepting and paying for material on the contention that the verbal promises made by a salesman or a broker were at variance with the terms of the written contract, or the quality of the displayed samples. Therefore, these various points of the law will be well illustrated by leading cases.

Generally speaking, if sand and gravel is sold f. o. b. the seller's location, the important consideration of the Court is: Did the material conform with the samples when the shipment was delivered *by the seller to the carrier*. On the other hand, if the selling price is f. o. b. the buyer's location, then testimony showing the condition of the material *when it reached its destination* is of greatest importance.

In other words, the seller is liable for changed condition of the material during its transportation only when the sale is made f. o. b. the seller's pits.

Buyer Bound to Inspect Goods

The rule is well established that if a buyer has no opportunity to inspect sand and gravel which he orders from samples, he *never* is bound to accept and pay for the shipment if the quality of the delivered material fails to equal the quality of the samples.

On the other hand, if the buyer has *ample opportunity* to inspect the sand in bulk but fails to do so and orders from samples, then he is *not* entitled to damages, unless it is shown to the satisfaction of the Court that the seller fraudulently induced the purchaser to enter into the contract by intentionally displaying samples of finer quality than the grade of the sand delivered. However, a buyer is not expected to travel *great distances* to inspect the material.

The latest higher Court case involving this point of the law is John Barkley & Co. v. Burguieres Co., 115 So. 915. The facts of this case are that a seller displayed samples to a prospective buyer. The purchaser was 100 miles distance from the seller's plant and did not inspect the bulk. He ordered a large quantity of the material. Later the buyer discovered that the delivered goods did not equal the samples and he refused to pay the bill. The seller filed suit contending that the purchaser was negligent in failing to inspect the bulk. However, the Court held this seller liable, saying:

"In view of the warranty implied in sales by samples, and of the fact that sales are generally made by sample because of the difficulty or impracticability of inspecting the bulk, and frequently where the bulk is at a distance from the purchaser, *we think such sales contemplate that the purchaser shall have the right to inspect the article after delivery*, and to reject it or demand a diminution of the price, if the bulk of the article does not agree with the sample, though he must act with reasonable promptness."

In this case the Court held the buyer's failure to inspect the material when it was loaded on the cars was justifiable because it was loaded 100 miles from the buyer's location.

Also, it is important to know that in all cases where the seller attempts to avoid liability because the buyer failed to inspect the sand and gravel, the buyer is entitled to a verdict if he can prove that the seller practiced fraud by the act of displaying good samples *with intentions* of shipping an inferior product. This is true irrespective of whether the sand and gravel is located conveniently for inspection by the purchaser. However, since it is very difficult for a purchaser to prove that a seller deliberately practiced fraud, the prospective buyer should inspect the bulk instead of relying upon examination of the samples.

The same rule is applicable where the buyer relies on a verbal or written description of the quality of the sand or gravel. In other words, if the buyer neglects to inspect the material which is convenient for his inspection, and later complains that the quality is inferior to his expectations, he cannot obtain protection of a Court unless he proves that the seller defrauded him.

Seller Liable for Excessive Damages

It is important to know that a seller who fails to deliver sand and gravel in conformity to the samples displayed may be liable for *all* damages sustained by the purchaser as a result of the breach.

For illustration, in the leading case of Gascoigne v. Cary Co., 104 N. E. 734, it was disclosed that a building contractor contracted to purchase from samples a quantity of material to be used in the construction of a building.

Upon delivery of the material the buyer failed to inspect the same but used it, since the general appearance did not disclose any variations. However, when the building was completed, the owner discovered that the color of the exterior was not off uniform shade or appearance and not similar to the samples displayed when the sale was made.

In the ensuing litigation the contractor contended that he was entitled to recover damages for the various items of expenses incurred on account of being obliged to take down the wall which he had built. The Court, in holding the seller liable to the contractor for the defective quality of the material and also liable for the necessary expenses of rebuilding the wall, explained the law on the subject, in the following language:

"The defendant (seller) impliedly warranted that the bulk should correspond with the sample. . . . the evidence was plenary that the shipments did not conform to the sample in quality. . . . A conclusion that no negligence had been shown, in connection with the uncontradicted evidence, that notice was promptly given to the defendant (seller) who declined further performance, would warrant the assessment of damages for not only the difference between what the plaintiffs (buyers) bought, and what they received, but also the expense of taking down and rebuilding the wall."

Buyer May Reject Portion of Shipment

Another important point of the law is that where the seller makes a shipment of sand and gravel, any portion of which does not equal the sample submitted, the purchaser may accept and pay for the portion of the shipment that equals the sample, and he may reject the balance.

For example, in Meyer, Wilson & Co. v. Everett Co., 184 F. 945, it was disclosed that a buyer and seller by correspondence entered into a contract

of sale for several hundred tons of material. During the correspondence the seller sent the buyer a sample.

The purchaser did not inspect the shipment until several days after its arrival when he discovered that a portion of it proved to be inferior to the sample. He accepted and used the good material but refused to pay for the balance.

The seller instituted legal proceedings to recover the full amount of the contract price, contending that, notwithstanding the inferior quality of a portion of the shipment, the purchaser technically accepted delivery of the entire shipment when he accepted and used a portion of it. In other words, the seller based his suit upon the idea that the purchaser was legally bound to accept and pay the contract price for all of the material regardless of its quality, because he had accepted and used a small portion.

However, the Court held this idea to be incorrect and, in holding the purchaser not required to pay for the unsatisfactory portion of the shipment, said:

"The idea is contrary to the rule of law applicable to the case, because it ignores the implied warranty upon which the defendant (purchaser) had a right to rely. The defendant (purchaser) acted within its legal rights in resisting the plaintiff's (seller's) demand for the price of the portion inferior to the sample. The rule is well established, by numerous decisions of the Courts, that a breach of an implied warranty of quality entitled the vendee (purchaser) to retain the goods, and, when sued for the purchase price, to set up the breach of warranty to reduce the sum recoverable by the vendor (seller) . . . The measure of damages which the buyer may claim for breach of an implied warranty of quality is the difference between the actual value of the property delivered and the higher value of the warranted quality; and if there is no other evidence of the value, the price agreed to be paid will be regarded as the value of the property of the quality warranted."

On the other hand, a buyer is bound to promptly notify the seller if he discovers that the sand and gravel does not equal the samples displayed when the contract of sale was completed.

For example, the leading case of Brown v. Scheurman, 128 Pac. 83, it was disclosed that a building contractor entered into a contract to purchase a quantity of material to be equal to the sample displayed by the seller.

Two or three shipments were received by the contractor without complaint. However, the government, for whom the building was being erected, discovered the material to be "off color" when compared with the samples and refused to permit the contractor to use it. Notwithstanding these proved important facts the seller was not informed of this complaint and continued to ship the material.

Later the contractor refused to accept the shipments and also refused to pay for the material previously shipped. The seller instituted legal proceedings to recover the full purchase price contending that he was not liable for any warranty, because the contractor had failed to promptly inform him that that the material was not satisfactory. The Court held the seller entitled to recover the full amount of the contract price and stated the law, as follows:

"It is too fundamental to require discussion here that a purchaser of personal property who receives and accepts the property, knowing at the time its condition and fitness or unfitness for the purpose for which he is purchasing, cannot accept the same and appropriate it to his use and continue to demand, receive, and accept more and more goods of the same character and quality, and then, after he has used it, raise objection for the first time that it was not up to the standard or like the samples of the goods he contracted for in the first instance. He must be fair and open about his dealings. If the goods furnished are not up to the standard or the sample, he must use reasonable diligence in apprising the vendor (seller) and make his objection, and refuse to accept further goods of the kind."

Authority of Employees

Moreover, the established legal rights of the parties are not affected by the failure of a broker or salesman to communicate the buyer's instructions to the seller. This is true because legally a broker or salesman is deemed a "go between" the buyer and seller. For this reason the seller is not usually liable for promises made by a representative, unless it is proved to the satisfaction of the Court that the seller performed some act by which the purchaser believed that the representative had proper authority to make valid contracts.

Therefore a buyer cannot avoid liability on a contract of sale by proving that a salesman promised that the shipped merchandise would be superior to the quality or grade *of the samples* displayed when the sale was made.

For instance, in the latest case of Adkins-Polk Co. v. John and Co., 297 S. W. 757, it was shown that a salesman displayed samples to a prospective purchaser. The buyer stated to the salesman that he would place the order if the quality of the material would prove *slightly better* than the samples displayed. The buyer placed the order and the salesman neglected to inform his employer that the purchaser desired better merchandise than the samples displayed.

The purchaser refused to accept the shipment contending that the goods when delivered did not equal the quality he expected. However, the evidence proved that the material when delivered to the cars equalled the sample displayed by the salesman. In view of this testimony, the Court, promptly held the buyer liable, explaining important law, as follows:

"The sale was by sample . . . We understand the rule to be that when a sale is made by sample, the sample becomes the standard of comparison for the eye as to quality and kind, *instead of the ear, and memory in description,* in determining whether the goods sold comes up to the description of the goods sent. The bulk of the goods, to complete the sale, must correspond with the samples; if not, the buyer may reject when delivery is tendered. A warranty is implied in sales by samples; that the goods shall be of like quality, character of the sample, a condition precedent to a completed sale."

When Employee May Modify Written Contract

Generally speaking, an ordinary employee is not empowered to bind his employer to verbal changes made to a written contract. However, if the employe is authorized to transact general business for his employer the Court may decide that the other party is entitled to hold the employed to fulfill the verbal variation made to the contract.

For illustration, although a written contract distinctly provides that sand and gravel shall be paid for in accordance with measurements, the purchaser is bound to pay for the same based on weights if, after the contract is signed, an authorized employe of the buyer agrees to make payments on this basis.

For example, in Steckel v. Cavanagh, 140 Atl. 401, it was disclosed that a seller of sand and gravel contracted with purchasers to furnish the latter the necessary amount of material to be used in the construction of a road.

The contract contained the following stipulation, which reads:

"We (sellers) knowing that our gravel weighs 93 pounds per cubic foot, and our sand weighs 81 pounds per cubic foot, agree to accept payment based on the above weights, measurement of batches to be agreed upon between us, this to avoid the time lost in weighing each truckload."

Later the buyer's superintendent informed the seller that for convenience he could bill the material by actual weight. In accordance with this agreement the sellers billed the material to the purchaser by actual weight taken from the scale tickets, marked on slips which were signed by the drivers of the trucking firm engaged by the purchaser.

The purchaser refused to pay for $4,708 worth of material contending that the superintendent had no authority to change the terms of the written contract. However, the Court held the buyer liable, saying:

"The evidence showed that the superintendent had charge of the entire work; that he hired and discharged help; made up pay rolls, ordered repairs, hired apparatus, and that the compartments of the trucks were so filled as to contain more than a cubic yard."

Therefore, it is quite apparent that while a salesman does not possess implied authority to vary the terms of a contract relating to the quantity or quality of sand and gravel, yet a superintendent, manager or other person who has general authority may bind his employer to such an agreement.

Recent Patents

The following patents of interest to our readers were issued recently from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 10c each. State number of patent and name of inventor when ordering.

1,720,688. Sand-riddle. George B. Pickop, New Haven, Conn., assignor to Malleable Iron Fittings Co., Branford, Conn.

1,720,786. Rotary kiln for burning wet cement materials, etc. Johan S. Fasting, Valby, Denmark, assignor to F. L. Smidth & Co., New York, N. Y.

1,720,849. Traction control and driving mechanism. Adolph C. Menningen, Milwaukee, Wis., assignor to Koehring Co., same place.

1,721,068. Gravity concrete-distributing apparatus. James E. Bushnell, North Plainfield, N. J., assignor to Ransome Concrete Machinery Co., Plainfield, N. J.

1,721,175. Trench-digging machine. Robert L. Brown, Milwaukee, Wis., assignor to Harnischfeger Corporation, same place.

1,721,246. Rock-crusher. John Bosshart, Los Angeles, Cal.

1,721,479. Drag scraper. Robert H. Beaumont, Radnor, Pa., assignor to R. H. Beaumont Co., Philadelphia, Pa.

1,721,587. Combined excavator and loader. Roy Burchill, Mitchell, Ontario.

1,721,594. Classification system for pulverized materials. Harlow Hardinge, York, Pa., assignor to Hardinge Co., same place.

1,721,761. Rope-thrusting shovel. Joseph J. Arnaud, South Milwaukee, Wis., assignor to Bucyrus-Erie Co., same place.

1,721,802. Vibratory screen. Clarence K. Baldwin, Scarsdale, and Samuel D. Robins, Woodmere, N. Y., assignors to Robins Conveying Belt Co., New York, N. Y.

1,721,803. Process of preparing limestone. William E. Carson, Riverton, Va.

1,721,821. Pulverizing-machine. Paul S. Knittel, Jersey City, N. J.

1,722,154. Dipper-tooth. Daniel H. Meyer, Elkville, Ill.

1,722,374. Dumping car. John A. Herb, Hopwood, Pa.

1,722,480. Hydraulic cement. Carl Pontoppidan, Copenhagen, Denmark, assignor to F. L. Smidth & Co., New York, N. Y.

1,722,675. Lowering chute. Frank Pardee and Frank Pardee, jr., Hazelton, Pa., assignor to Anthracite Separator Co., same place.

1,722,792. Screen. Oscar C. Gruender, Chicago, Ill.

1,723,055. Attrition-mill. Robert S. Mechlin, Springfield, Ohio, assignor to Bauer Bros. Co., same place.

1,723,190. Art of sand washing. Arthur J. Mason, Homewood, Ill.

1,723,367. Baffle-plate arrangement for concrete-mixers. Hugh P. Paris, King county, Wash., assignor to Paris Transit Mixer Co., Seattle, Wash.

1,723,372. Process of separating lignite from sand and gravel. Joseph W. Teid, Memphis, Tenn.

1,723,447. Loading-skip. Samuel Shafer, jr., Milwaukee, Wis.

1,723,615. Sand-conditioner. Ray L. Hamlin, Stockton, Cal.

1,723,726. Apparatus for pulverizing materials. William T. Doyle, Boston, Mass., assignor to Sturtevant Mill Co., same place.

1,724,007. Vibrating screen. James Crabb, sr., Joliet, Ill.

1,724,033. Concrete mixing and spreading machine. Erich H. Lichtenberg, Milwaukee, Wis., assignor to Koehring Co., same place.

1,724,043. Concrete-spreading machine. John F. Robb, Cleveland Heights, Ohio, assignor to Koehring Co., Milwaukee, Wis.

1,724,072. Pulverizing apparatus. Fred H. Daniels, Worcester, Mass., assignor to Riley Stoker Corporation, same place.

1,724,104. Excavating apparatus. John W. Page, Chicago, Ill.

1,724,166. Excavator or the like. Svante R. W. M. Bager, South Milwaukee, Wis., assignor to Bucyrus-Erie Co., same place.

1,724,207. Excavator or the like. Werner Lehman, South Milwaukee, Wis., assignor to Bucyrus-Erie Co., same place.

1,724,318. Attrition-mill. August Schuchardt, Winona, Minn.

1,724,369. Mixer-timer. Nils M. Rosendahl, Waterloo, Iowa, assignor to Construction Machinery Co.

1,724,370. Scraper. Bruce E. Rose, Stockton, and George Woolwine, Selma, Cal.

1,724,403. Process of preparing concrete. George Hutchinson, Lake Worth, Fla.

1,724,687. Method of materials (for producing a concrete mass). William H. Stansbury, Aldan, Pa.

1,724,786. Centrifugal hammer. Lesher Wharton Van Buskirk, Easton, Pa.

1,724,850. Concrete-mixer. Jack M. Owen, Long Beach, Cal.

1,724,876. Unit pulverizer. Austin A. Holbeck, Cleveland, Ohio.

Lime for Construction Purposes

Tabulations of the amount of lime used in 1928 for construction purposes are being compiled by the Bureau of Mines. These will be submitted for publication in the usual annual Mineral Resources Report as promptly as possible.

In the meantime, in response to special requests, the bureau has made a partial summation of statistical data in hand and announces that in New England and Seaboard States, south to and including Virginia, a total of approximately 620,000 short tons of lime was made and sold by producers in 1928, for use in building and other construction purposes.

PIT AND QUARRY FOREIGN DIGEST

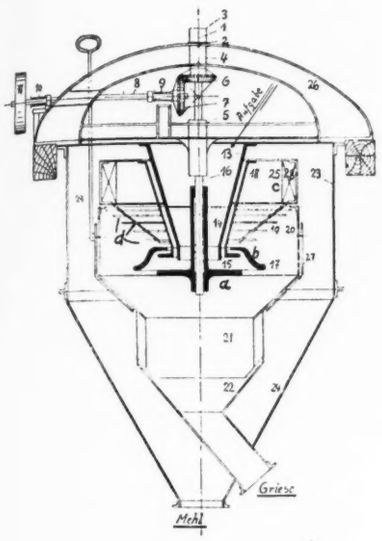


Fig. 1

Windsifters for Pulverization

Fig. 1 shows the Moodie-Pfeiffer "Selector" which produces flour of a high degree of fineness, up to 0 per cent residue on sieve No. 100. In this device the moving wind stream passes through narrow superimposed rotating plates. The finely divided material passes through to the outside cone and drops out of the bottom outlet. The coarser powder is caught by the plates and leaves the side outlet near the bottom. More or less similar to this is the Amme-Luther sifter made by Polysius and shown in Fig. 2. The Ventoplex sifter shown in Fig. 3 has movable paddles on the ventilator wheels. In comparison with these are shown the Raymond sifter, usually used in conjunction with their mill, Fig. 4, and the Rena coarse sifter, Fig. 5, which operates on the same principle. The Babcock apparatus is shown in Fig. 6.—Rosin and Ramler (*Zement*, July 18, 1929).

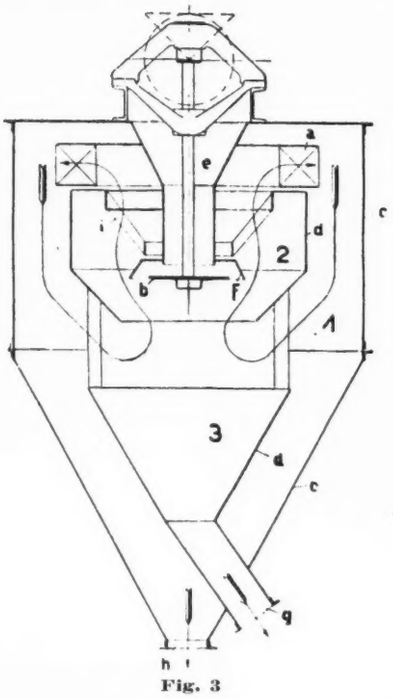


Fig. 3

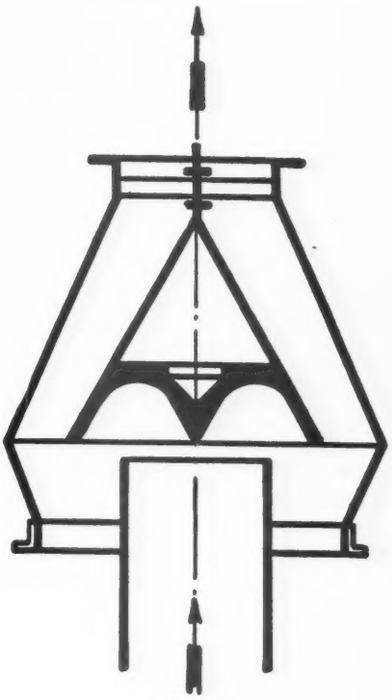


Fig. 5

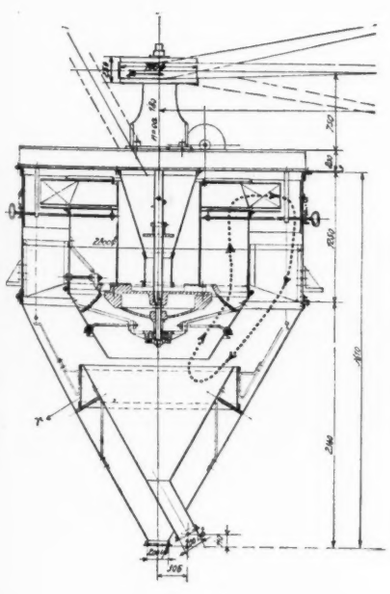


Fig. 2

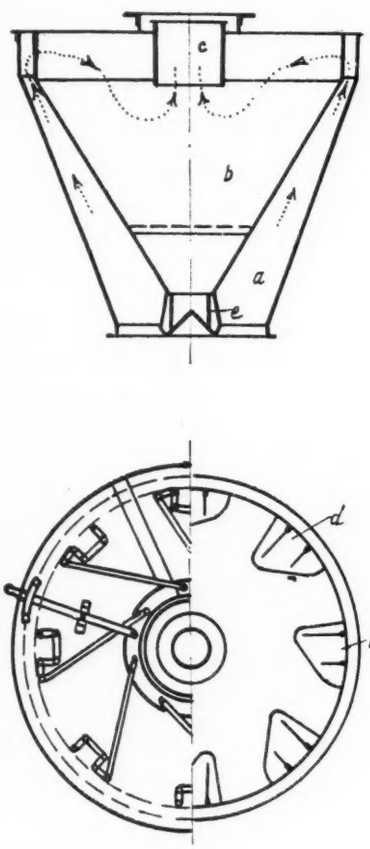


Fig. 4

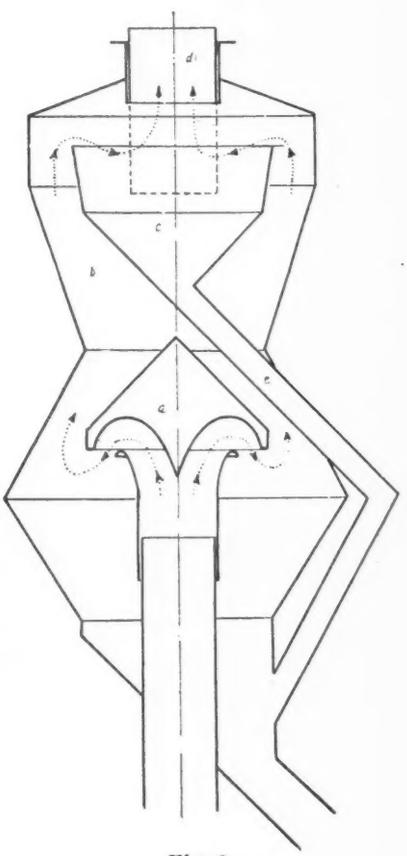


Fig. 6

Natural Cements

In general it may be safely stated that investigation into the properties of the so-called natural cements definitely indicates that these products are inferior to the usual standard cements. Because of their method of production, their non-uniformity of chemical composition, as well as the lack of care in the burning, as evidenced by the fluctuations in strength when tested according to standard methods, and the relatively unfavorable behavior in actual practice when used as building material, these natural cements are classed between the hydraulic limes and the usual portland cements in value. Like mixed cements and low burnt cements—which contain cement lime up to about 40 per cent, or raw limestone up to about 30 per cent, or slag up to about 20 per cent—they have the common characteristic, unreliability of quality. The latest German standard for natural cements, the name "natural portland cement" being considered unwarranted is as follows:

"A hydraulic mortar containing not less than 1.9 parts by weight of lime (CaO) to 1 part by weight soluble silicic acid (SiO_2) plus alumina (Al_2O_3) plus Iron oxide (Fe_2O_3) produced by burning siliceous limestone at least to the sintering point with subsequent fine grinding. Siliceous limestone in this sense is a limestone with a content of at least 2.3 parts silicic acid to 1 part iron oxide plus alumina and a magnesia content of not more than 1.5 per cent. For the regulation of the desired characteristics additions after the burning in amounts up to 20 per cent are permitted. . . ." The author points out that this last provision of the official definition for these products confirms his own conclusions, that while cements are valuable for certain purposes, their quality is so uncertain as to make their substitution for portland cement inexpedient. — Haegermann (*Zement*, July 11, 1929, 861-868).

Reburning of Portland Cement

When finished, burnt and ground Portland cement, containing the usual small percentage of free lime is reburnt in a rotary kiln, most of the free lime disappears, being combined with other constituents. The greatest part of the lime combines with the silicic acid and the alumina before the calcination is completed. This second stage of lime combination occurs only at considerably higher temperatures, a fact previously observed, namely, between 1100 and 1300 deg. C. Samples were taken from a rotary kiln during such reburning at various points from the sintering zone and it was found that various forms of portland cement, i. e. quick or slow hardening could be produced, depending at what stage of the reburning and therefore at what temperature the heating of the product was stopped. —Schriever and Prüssing (*Zement*, July 18, 1929).

Temperature and Setting Time

The setting of portland cement is invariably accelerated by rise in temperature, but there is no direct connection between the actual times and the variations. Rapid-hardening cements were found to behave similarly. Aluminous cements which evolve heat on setting give conflicting results. A slight reduction of the strength of concrete with rise of temperature during setting is attributed to increased internal stresses. The strength obtained by curing for a given time at 1.5 deg. C. was found to be only half that which the same treatment at 16 deg. C. Laboratory tests with aluminous cements again show a less strength at low temperatures, though thermal effects make comparison with large scale work difficult. If only the earlier part of the treatment of any cement is at low temperature, full strength may, or may not be attained. Different results have been recorded as to whether any hardening occurs below 0 deg. C. In most cases a period of freezing during curing slows down the rate of increase of strength when the temperature has again become normal. This applies also to aluminous cement. There is some evidence to show that the effect of freezing is more severe the earlier after mixing it occurs. Experimental data on alternate freezing and thawing are uncertain. Increased cement or water content of mix increases the damage to portland cement concrete. There is some indication that unduly high temperatures may cause failure with aluminous cement.—Thomas & Davey (Dept. Sci. Ind. Res. Bldg. Res. Spec. Rept. No. 13, 1929, 38 pp. & B. C. A.).

Bentonite

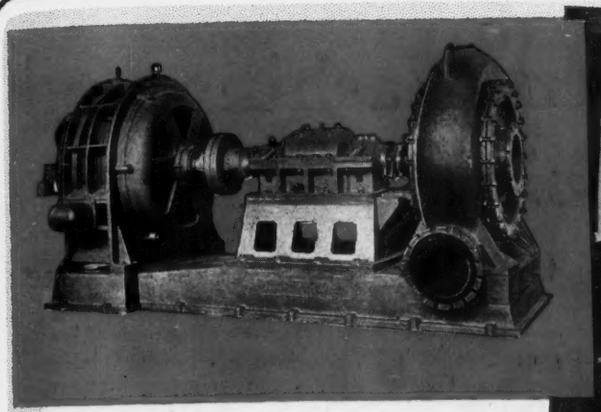
Pulverized bentonite is fine grained, light colored, dark or black. After firing the color is white, buff or brown. The fracture may be conchoidal, shale-like or none at all. Its affinity for water is strong, being able to absorb up to ten times its volume. It appears to be a volcanic ash or lava altered to a hydrated complex compound of alumina and silica. Much of the substance in bentonite has not progressed beyond colloidal state as fully one half of the particles in certain samples were of ultra microscopic size. Other investigators state that the natural product contains no gel colloids but is composed of montmorillonite (MgCa) $OAl_2O_3\ 5SiO_2\ nH_2O$ (n=approx. 8) and sometimes beidellite, $Al_2O_3\ 3SiO_2\ xH_2O$ (x=4 approx.). Colloidal properties are attributed to felted texture and micaceous structure in which the crystals have appreciable size in two dimensions but thickness in colloidal magnitude. The relative amount of swelling in water was found to be a rough method of classifying bentonite. Swelling may be controlled by the addition of salts or by alteration of the P_h. Heat destroys the colloidal properties of the mineral. Bentonite is mined by stripping the overburden and breaking up the beds with plows, although in some cases where the overburden is 50 to 100 ft. the main haulage ways are timbered. Some of the present and proposed uses for bentonite are as a filler in paper manufacture, oil cloth, linoleum, rubber, ceramics, portland cement, road building materials, greases, putty, foundries, phonograph records, electrical insulation, paste and glue. It may also be used as an adsorbent, emulsifier, or peptizer in soaps and detergents. It is used also in the refining of oils and fats, sprays, insecticides, fungicides, roofing materials, waterproofing, desiccating agents, manufacture of dynamite, drugs and cosmetics.—C. W. Davis and H. C. Vacher (Mines. Tech. Paper, 438, 51 pp. and C. A.)

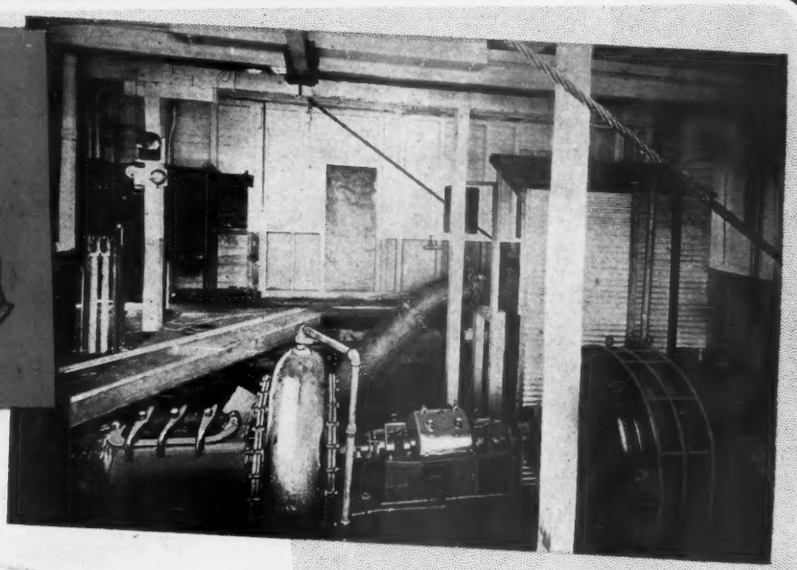
Clay Suspensions

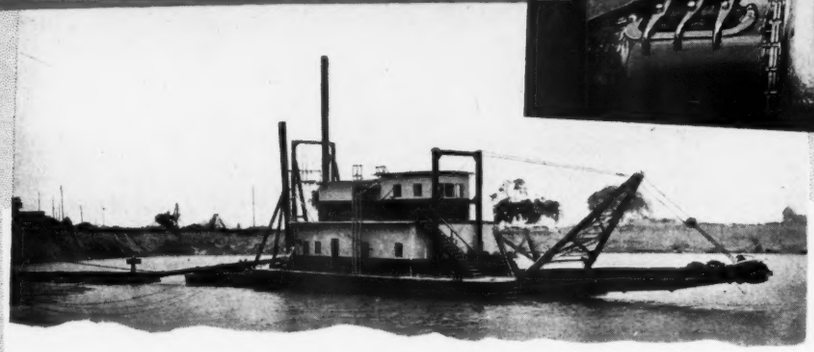
Suspensions of clay are readily flocculated by the addition of small quantities of hydrophillic colloids. The flocculation values for casein, albumin, gum arabic and starch are small, gelatin has a high value, but the most effective agent is a sol of a native Japanese plant, which precipitates suspensions of clays when present in a concentration of only 2 parts per million. An acid suspension of clay is more susceptible to flocculation than an alkaline suspension. Suspensions of charcoal in water are difficult to flocculate by hydrophillic colloids, but are readily flocculated by them after the addition of a small amount of clay. Clay particles in nonaqueous media also are flocculated by hydrophillic colloids. The precipitated particles are much coarser than those flocculated by electrolytes, and the method is therefore applicable to the acceleration of filtration in industrial processes.—T. Okazawa and T. Sano. (Bull Inst. Phys. Chem. Res. Tokyo, 8, 356-368 & B. C. A.)

Pit and Quarry

ANNUAL Hydraulicking & Dredging SECTION







AMSCO PRODUCTS

Include Ball and Tube Mill Liners, Crusher, Grinder and Pulverizer Parts, Chains, Sprocket Wheels, Elevator Buckets, Screw Conveyors and Conveyor Case Liners, Gears, Grab Buckets, Crane and Shovel Parts, Tractor and Crawler Parts, Apron Feeders, Grizzly Bars, Pumps, Shock, Wear and Abrasion-Resisting Parts for Cement, Stone, Lime, Sand and Gravel Handling Equipment.

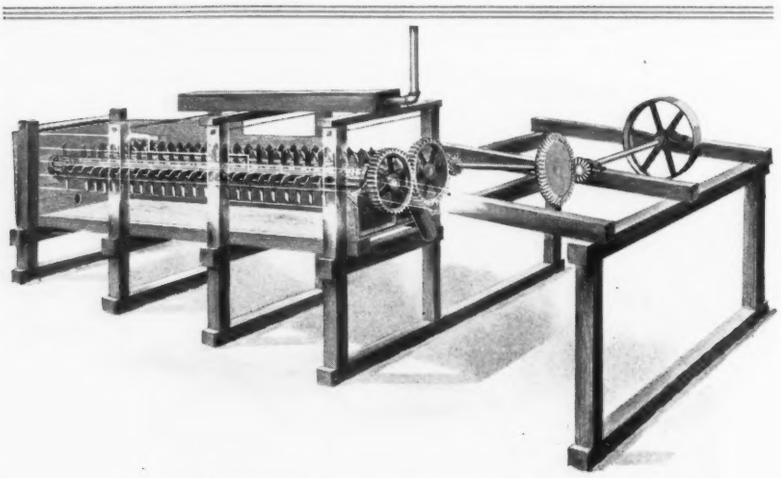
W. D. HADEN'S
West Point, Texas, Operations
employ an AMSCO Manganese Steel Dredge Pump and AMSCO hull piping and fittings.

One of the designing engineers says, "The W. D. Haden Company have just commissioned and placed into excavation production work the latest addition to their fleet of hydraulic pump dredges. In design it expresses the latest development of engineering thought. As a complete working tool and for the several equipment elements it comprises construction which is the best obtainable."

An AMSCO Pump was selected, as on most modern dredges. The factors governing this selection were simplicity of design, trouble-proof operation and maximum length of life assured by wearing parts of AMSCO Manganese Steel.

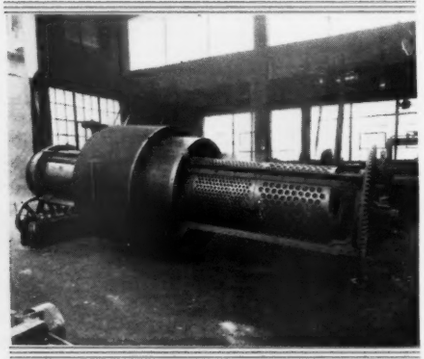
Let AMSCO Pump Engineers tell you of the accomplishments of dredge operators everywhere who are using AMSCO Pumps.

American Manganese Steel Company--Chicago Heights, Illinois

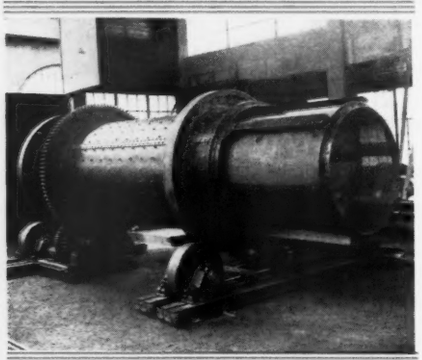


McLANAHAN IMPROVED DOUBLE STEEL LOG WASHER

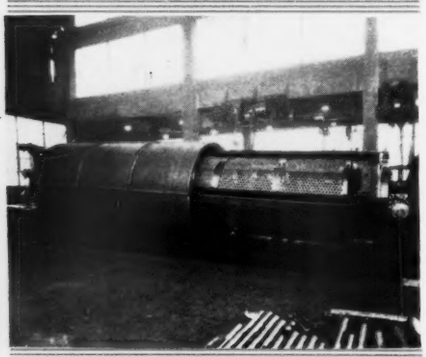
MACHINES RECENTLY BUILT AND INSTALLED



Combination Scrubber and Screen



All-steel Scrubber, 250 tons per hour capacity



30-ft. All-steel Heavy Duty Screen

Modern Washing and Screening Machinery

That Insures Clean Sand, Gravel and Stone

WHEN a producer becomes known for the cleanness of his sand and gravel, it isn't long before his product is in greater demand and commands a better price. Those who have the responsibility of spending thousands of dollars for concrete building construction or road building do not risk buying poor materials. Consequently, they buy where they are sure of getting good clean sand and gravel.

By installing a McLanahan Improved Double Steel Log Washer you are placing yourself in position to demand the highest market price for your product—a product free from clay, silt or other foreign matter.

The McLanahan Washer has simplicity combined with strength, and is easily accessible for the very few repairs needed from time to time. It will produce at an unusually low cost a large tonnage of uniformly clean product, removing clay, loam, dirt, etc., from stone, ore, rock, sand, gravel—in fact practically any product we know of except coal.

Write us today for complete information.

PRODUCTS MANUFACTURED BY McLANAHAN-STONE MACHINE COMPANY

Single and Double Roll Crushers
Steel Log, Cylinder, Screen Washers and Scrubbers
Jigs for Non-Precious Ores
Cylindrical, Shaking and Cone Screens
Steel Conveyors and Elevators
Picking Tables and Feeders
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Electric and Friction Hoists
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Special Machinery and Heavy Castings

McLANAHAN-STONE MACHINE CO.
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We also make the Famous McLanahan Single Roll Crusher—the most economical crusher on the market. Ask us about it.

Rock Island Sand and Gravel Company Operates Modern Plant in Mississippi Valley

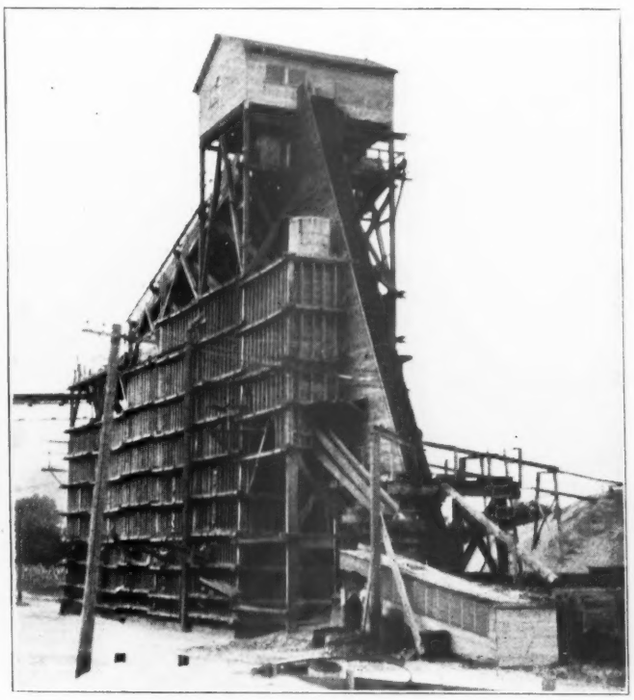
Company One of Pioneer Operators in That Section

BY W. E. TRAUFFER

THE Rock Island Sand and Gravel Company of Rock Island, Ill., is one of the oldest sand and gravel producers in the Mississippi valley. The company was incorporated in 1902 and for many years operated dredges on the Mississippi river. In 1922 the present plant was built. This plant was designed by the Link-Belt Company and most of the equipment was furnished by that company. Its capacity is about 100 yd. per day.

The plant is located on Mill street in Rock Island, about 3 miles from the heart of the city. The property of 90 acres is on a point of land ½ mile east of the Rock river on the Mississippi river. The overburden varies from nothing to 14 ft. in thickness and the gravel deposit averages about 25 ft. in depth. The gravel in the deposit averages about 40 per cent, of which from 5 to 10 per cent is over 2½ in. in size and requires crushing. The pit, which was started when the plant was built, is about ½ mile long and 700 ft. wide and opens at one end into the Mississippi river.

The top of the gravel deposit is a few feet above the normal stage of the Mississippi, allowing the



View from southwest. Crusher and elevator in foreground

Plant as seen from waste pile

use of a shovel in removing the overburden. A P & H Model 600 gasoline shovel with crawler mounting and a 1-yd. bucket loads the overburden into two trains of six Western 1½-yd. side dump cars on a track along the edge of the pit. One of these trains is drawn by a Plymouth 4-ton gasoline locomotive and the other by a Davenport 3½-ton locomotive equipped with a Fordson motor. A Whitcomb 3½-ton gasoline locomotive is held in reserve for an emergency.

Crane loading into bins at downtown distributing yard

Crusher with bucket elevator at left

The overburden, which is usually wasted, is being put to a good use at this pit. A number of fishermen who live on the point of land at the junction of the two rivers have been practically cut off from the mainland by the company's pit. In times of high water their only means of reaching land was by boat. A large dam is being built at the end of the pit forming a roadway which will be high and dry even when the river is at flood stage. The overburden is dumped at the dam and is spread by a P & H-35 backfiller. This is equipped with a special boom.

Locomotive, dump-cars and backfiller on dam

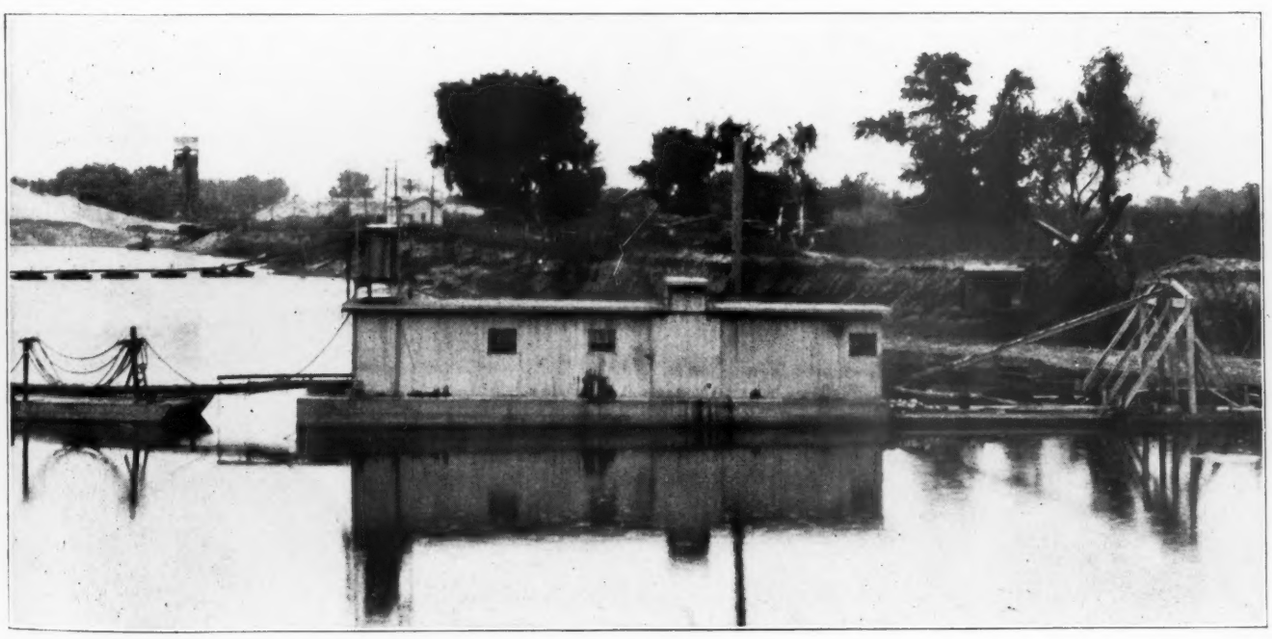
Fill of overburden as protection from floods

Dredging Operations

The wooden dredge now in operation was built about 2 years ago at a nearby boat yard. It is 50 ft. long by 20 ft. wide. The 35-ft. Eagle "Swintek" screen nozzle ladder, which was installed in the spring of this year, is driven by a 15-hp. electric motor through a gear and Texrope drive. Cincinnati "Sandow" suction hose is used. The Amsco Model M 10-in. dredging pump is belt-driven by a General Electric 250-hp. variable speed motor. The ladder is raised and lowered by a Clyde 2-drum hoist driven by a 15-hp. General Electric motor which also operates the single spud in the center of the dredge. The dredge pump is primed by a Dayton-Dowd 2-in. centrifugal pump driven by a 7½-hp. Northwestern motor. The operator of the dredge sits behind the hoist, all controls and switches being within easy reach.

Scraper moving waste pile

The dredge line is about 800 ft. long and is supported on barrel floats. The pipe sections are connected by Cincinnati Rubber Company dredging sleeves and cable slings using Knox No. 2 cable clamps. A small frame building on the bank of the pit houses another Amsco Model M 10-in. booster

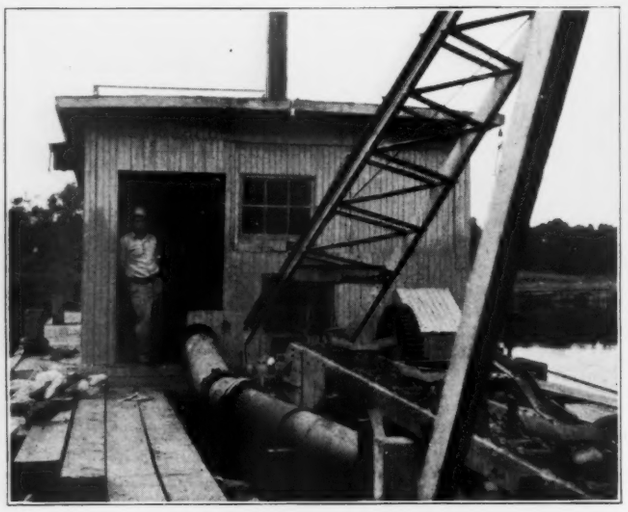


Operations as seen from fill

pump belt driven by an Allis-Chalmers 200-hp. motor. This pump was installed in 1926 when the distance to the plant became too great for one pump to handle. Both of the dredging pumps are driven by Sykes belting on 26-ft. centers.

Plant Operations

The pipe line discharges into a concrete sump at the plant, the water draining out into the pit.

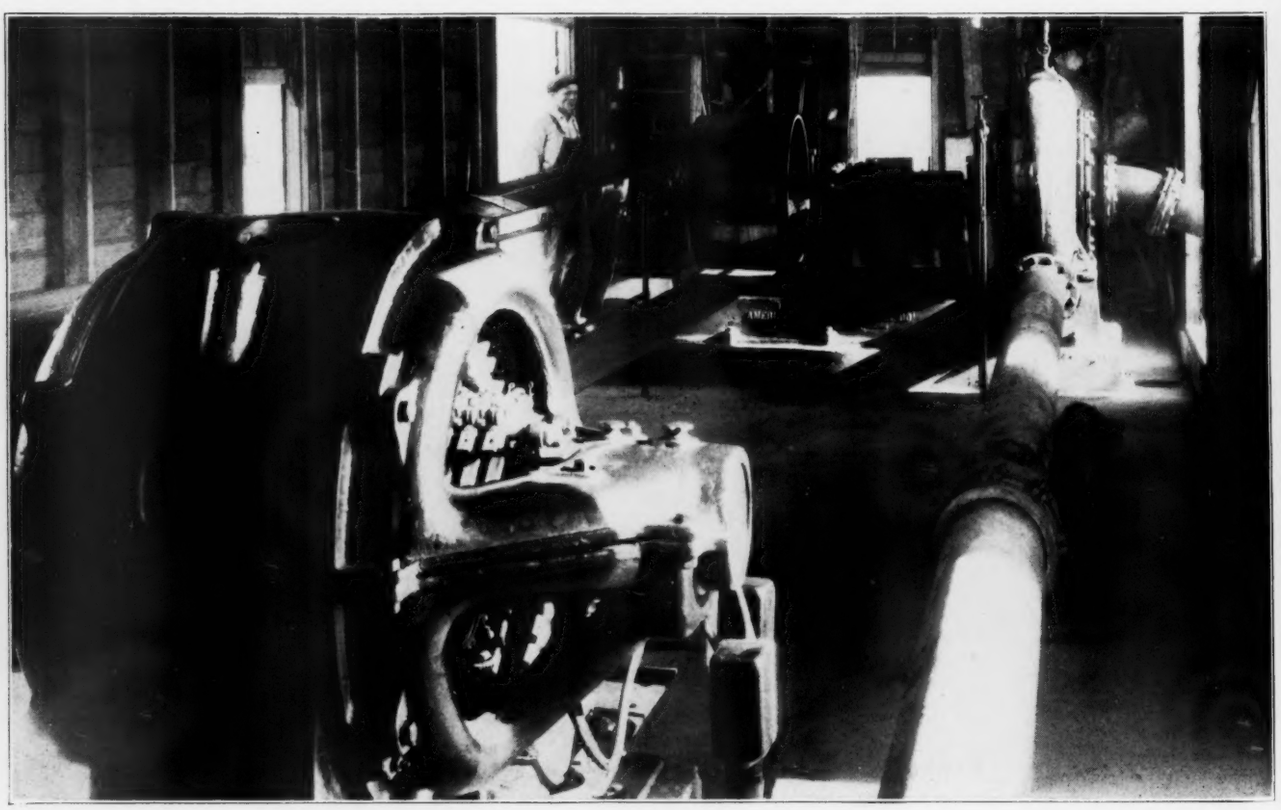


Ladder elevated. Pump at rear

A Link-Belt bucket elevator on 85-ft. centers discharges the material into a steel dividing hopper at the top of the plant feeding the two sets of screens. The elevator is driven by a 50-hp. General Electric motor through a Link-Belt silent chain drive. The two sets of four Link-Belt "Dull" 96-in. conical screens are driven by a 20-hp. General Electric motor through a Link-Belt silent chain drive. Both drives are housed in a small frame building on top of the plant. A special steel framework around the elevator is used to support it when repairs are being made.

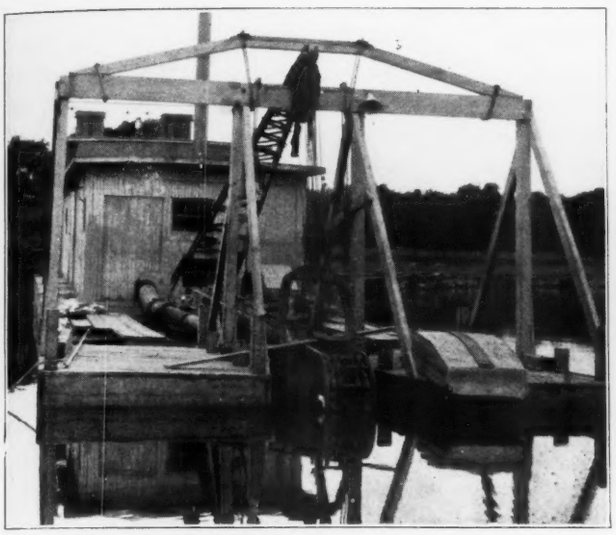
Close-up of sand cones

The screens have 2¼-in. round, 1¼-in. square,

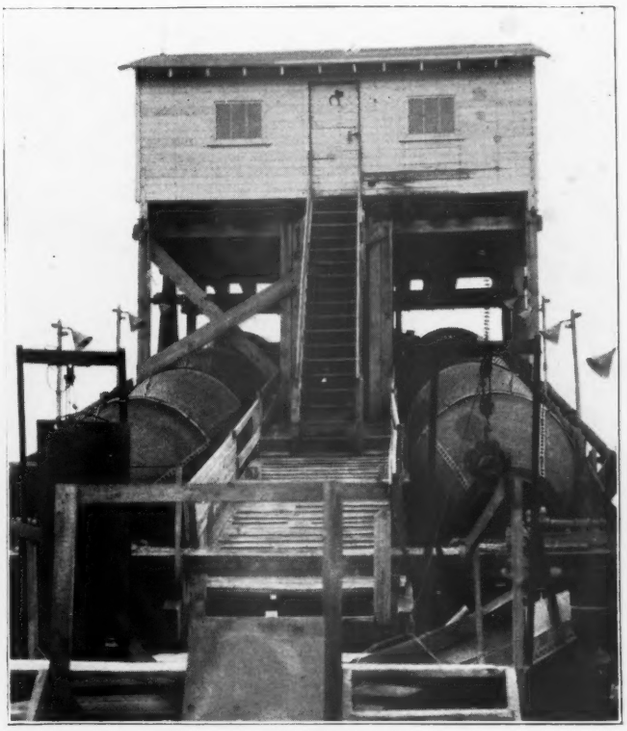


Ten-inch booster pump on edge of dredge pond

and ⅝-in. square perforations and ¼-in. wire mesh, both sets being identical. They separate the material into four sizes, 2¼ to 1¼-in., 1¼ to ⅝-in., ⅝ to ¼-in. and sand. The three sizes of gravel go direct to the bins. One of the ¼-in. screens has perforated baffle plates at the feed end to minimize wear on the screen. This is of original design and has been found very effective.



Dredge and ladder viewed from shore



Conical screens with perforated chutes to sand cones in foreground

The sand discharges from the screens into two steel chutes also of original design. Each chute has a bottom plate with 3/16 by ¾-in. perforations and a drop section which can be lowered to cover the perforations. The sections are lowered to run sand into the waste piles and raised for running to the separators. The two Link-Belt cone sand separators are used, one for concrete sand and the other for mason sand. When there is an oversupply of sand both separators discharge into the same steel flume to the waste pile.

Interior of dredge, showing pump, controller, hoist and drive

Supt. W. F. Herget at end of ladder

The oversize from the 2½-in. screen goes through a chute to an Austin No. 3 gyratory crusher on a concrete foundation near the sump. It is belt-driven by a 30-hp. General Electric motor and discharges into the sump from where the material is again elevated to the plant. When there is a surplus of 2½ to 1¼-in. stone this can also be diverted to the crusher. The five bins at the plant have a total capacity of about 1,000 tons.

Miscellaneous

Washing water comes from a well near the plant which is connected with the pit by 300 ft. of 24-in. pipe. An Allis-Chalmers 8-in. centrifugal pump driven by an Allis-Chalmers 125-hp. motor delivers 2,250 g.p.m. at a 65-ft. head. The pump sets in a concrete pit so that low water will not interfere with operations.

In the seven years of operation of this plant the waste sand pile has grown to such proportions that it was found necessary to devise some means of moving it. A Sauerman 1-yd. Crescent scraper system was installed about a year ago and has solved this problem. A 40-ft. timber mast is used and the scraper is operated by a Sauerman 2-drum hoist driven by a 30-hp. General Electric motor.

Power for all operations is obtained from public service wires at 4,800 volts and is reduced at the dredge by two 150-kva. transformers to 440 volts for dredge operations. The 4,800-volt current is carried to the dredge by a Jerome super-service cable following the dredge line. The booster pump house and the plant also have their own transformers.

Leschen flat strand cable is used throughout the plant and most of the motors and electrical equipment were furnished by the General Electric Company.

Distribution

About 90 per cent of the shipments from the plant are made by rail over the C. R. I. and P., C. B. and Q., C. M. St. P. and P., D. R. I., and the Rock Island Southern railways. About 5 per cent is shipped by truck from the plant and the remainder is loaded onto barges for shore work along the Mississippi river. A small loading plant at the edge of the pit is used for the barges. A large proportion of the material shipped by rail goes to the downtown yards of the company on the river front

(*Continued on Page* 82)

Shovel loading overburden into cars

Hydraulic Dredge Embodies Latest Developments in Design and Construction

W. D. Haden Company, Seeking Maximum Efficiency Installs Plant Built for Special Conditions

By BRADLEY S. CARR

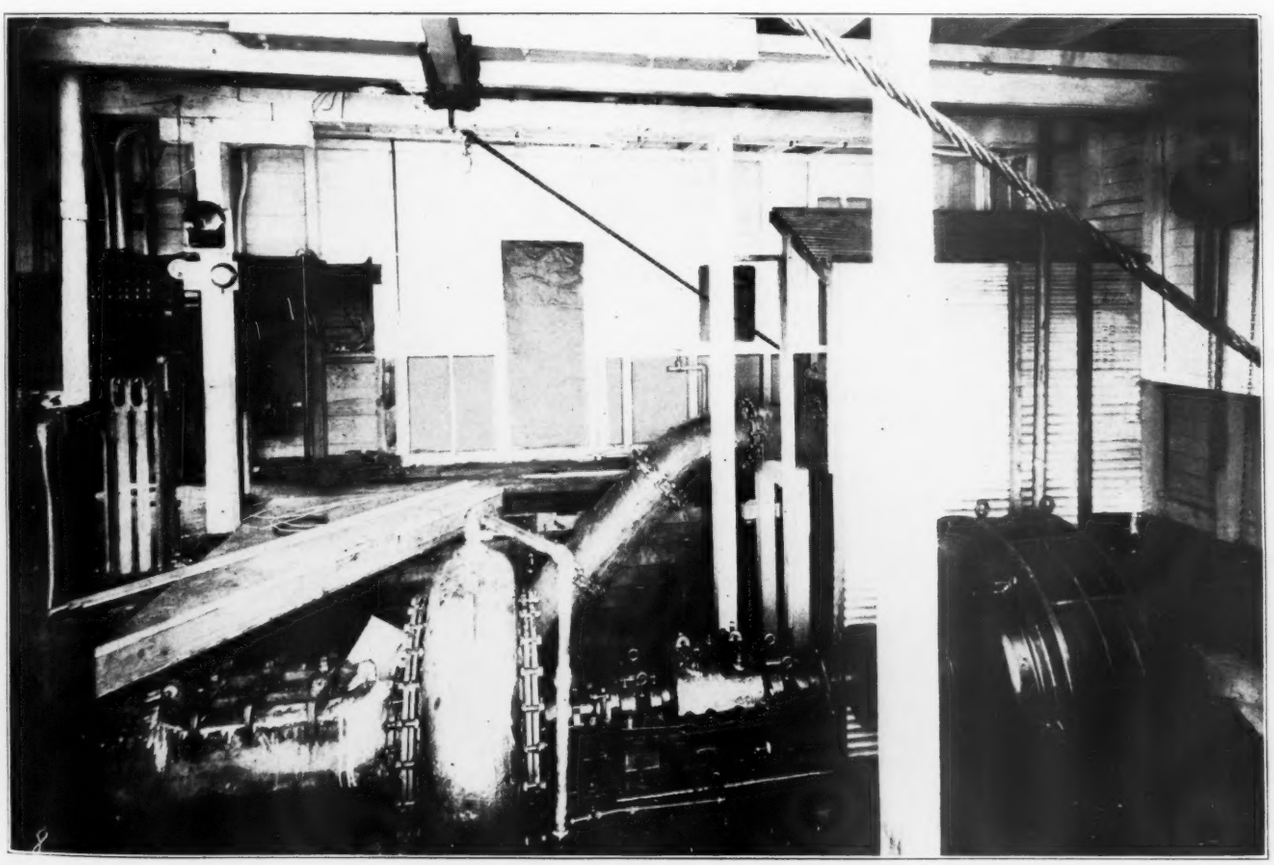
THE W. D. Haden Company, at its West Point, Texas, plant recently placed in operation the latest addition to its fleet of hydraulic pump dredges. In design it expresses the latest development of engineering thought. As a complete working tool, and for the several equipment elements, it comprises construction which is the best obtainable.

A 15-in. Amsco, Type H, heavy-duty sand-and-gravel dredge pump; direct-connected to a 500-hp. Fairbanks-Morse motor of 514 to 505 r.p.m., 3-phase, 60-cycle, 2,200-volt slip-ring design, equipped with drum controller and resister, for 50 per cent speed reduction variation, is used for excavation work. All hull piping and fittings are of standard Amsco design and manganese steel.

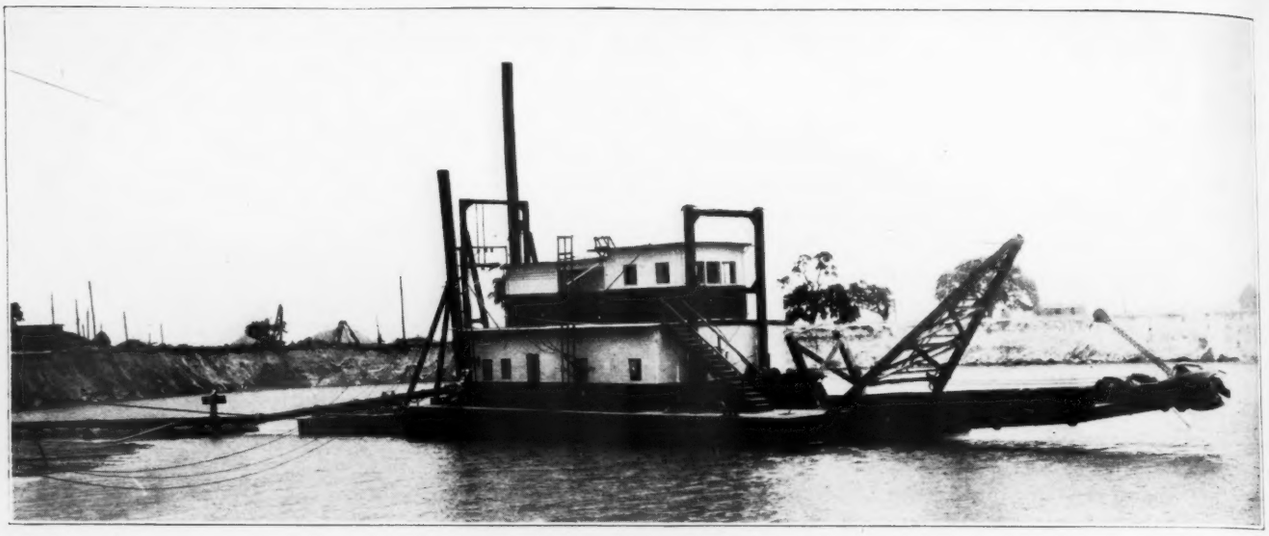
The hull is of wood, with heavy timber construction for the gunwales and the fore and aft bulkheads. It is 76 ft. long, 34 ft. wide and 7 ft. 10 in. deep, and provides a ladder-well opening 24 ft. long by 10 ft. 8 in. wide. A heavy structural steel ladder, mounting a rotary cutter, of spider-hub-arm and renewable-blades design, is used for digging the deposit. The A gantry and spuds gallows frames are of structural steel. The spuds are timber with armor protection.

A 5-drum Ellicott dredge hoist is used for all lines work. It is provided with the latest type of hydraulic, ram lever, controls for manipulating the frictions and brakes. Auxiliary winch heads extending outside the cabin walls are used for handy line work.

The cabin is of wood-framed construction. The main portion houses the engine room and the hoist. The upper portion provides the operator's lever room, which is forward; and a cupola, with ventilated sides, houses the resistance grids of the dredge-pump motor. As a whole, it is well braced and roomy. In its framing, unique provision has been allowed for crane trolleys, both fore and aft



Engine room on W. D. Haden Company dredge showing heavy duty gravel pump and direct connected motor



General view of 15 in. hydraulic dredge of the W. D. Haden Company

over the dredge pump and its motor, and thwart ships for handling equipment parts to the boat side.

All equipment is individually powered by electric motors, thus providing maximum flexibility of operation and economy to the dredge as a whole. Electrical energy is brought to the dredge from the shore transformer station by a submarine cable. The cable is independent of the discharge pipe-line pontoon system, and is supported in the water by a series of small steel-tank floats.

The entire design presents fitness-of-purpose construction. It has centralized controls, with close-up, clear vision for the operator and his contacts with the deposit bank and the floating pipe line. Good weight distribution of equipment has provided trim ship to the dredge for both the raised and the lowered positions of the ladder.

In the design of this dredge the engineers executed the idea that it is a complete digging tool and that all equipment elements are in balanced relation to one another and consistent with the demands that are constantly exacted. Engineers of the pump department of the American Manganese Steel Company, after a thorough and scientific hydraulic survey of the property, cooperated in selecting equipment that would work the deposit most efficiently. The Ellicott Machine Corporation attended to all dredge engineering details and supplied all equipment except the dredge-pump, its motor, and hull pipe-line fittings.

Rock Island Gravel Plant

(*Continued from Page* 80)

at First Avenue and Twentieth Street in the heart of the downtown district.

A Brownhoist 20-ton locomotive crane with a 1¼-yd. clamshell bucket unloads the material from the cars into a row of steel hoppers with a total capacity of 500 cu. yd. or to storage piles. Deliveries are made by six Mack trucks with trailers owned by the company. Additional trucks are hired. A Howe scale at the yard has a Weightograph attachment which instantaneously gives the net weight of the load. A warehouse and yard also carry a full line of building and mason supplies.

The main office is maintained near the yard in addition to the yard offices and the plant office. Officers of the company are: C. J. Larkin, president; Robert F. McConochie, vice-president; Wm. H. McConochie, treasurer; and H. J. Larkin, secretary and manager. W. F. Herget is superintendent of the plant.

Proposed Extension of Port Facilities

Certain schemes proposed for the extension of port facilities at Singapore have been referred to the Imperial Shipping Committee at London for its approval, and the committee has made a number of recommendations involving the expenditure of approximately $5,225,760, according to Consul General Frank C. Lee of Singapore in *Commerce Reports*. These recommedations include reconstruction and extension work that will give a total length of deep-water wharfage of 3,300 ft. and increase the present accommodations of the port by 23 per cent.

Quickard a High Early Strength Cement

The physical characteristics of Quickard, the high early strength cement manufactured by the Ash Grove Lime and Portland Cement Co., have been compiled and published in an attractive illustrated bulletin by the company. Illustrations of the many places where Quickard may be used with advantage are given together wit hsome special specifications governing high early strength cements in general.

Self-Unloading Boats in the Transport Of Building Materials

By LEATHEM D. SMITH

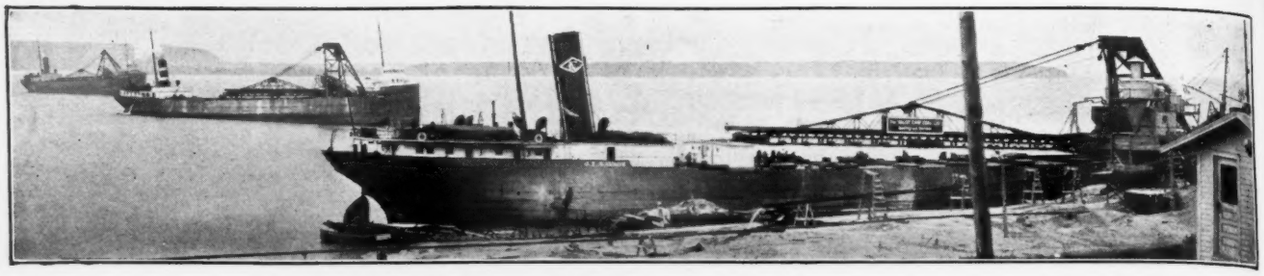
IN THE production and distribution of bulk materials such as sand, gravel, crushed rock and cement for the building material industries, the first requisite is low cost. In the production end of these materials, a great savings can be made by large tonnage plants working with the best possible supplies of raw materials rather than small tonnage plants located because of their proximity to market rather than because of the availability of their deposits or supplies of raw materials. The "low cost of water transportation" is almost a byword and is sometimes deceiving, for many water operations have been unprofitable, and the use of many waterways have been practically abandoned due to the difficulty of working out the water terminal facilities and the delays to the floating equipment occasioned by such inadequate terminals. This problem is partly true in the handling of materials for building because of their low cost and the necessity for obtaining a very wide distribution to reach the trade. On this account the haulage of these materials by railroad and trucks has increased more rapidly than the water transportation tonnage due to the flexibility of car and truck deliveries, in spite of their higher per ton mile cost as compared to water transportation.

The writer owned and operated a crushed stone plant at Sturgeon Bay, Wisconsin, the product of which was moved by water, using, up to the time of the war, tugs and barges with various kinds of equipment for the unloading. Because of the delay in the unloading, the slow speed of propulsion, and the weather hazards and delays contingent upon this method of operation, the markets were limited to within a radius of less than 100 miles from the plant.

In 1923, we designed and patented the tunnel scraper system of unloading for the converting of standard bulk cargo ships into self unloading vessels. This system has been installed to date on seventeen lake ships which are carrying sand, gravel and stone a distance of 500 miles, and unloading same on the dock for a total freight and discharging cost of less than 50c per ton.

Markets were rendered available for the stone produced at Sturgeon Bay and the tonnage of this plant, which is now owned by the Dolomite Company of Cleveland, has grown from 50,000 tons

The "Material Service" unloading at South Side Yard. The "Sierra" unloading at same time without interference.



Three self-unloading boats in line

in 1921 to over a million tons this season, all due to the improvement in water transportation by the use of self unloading vessels.

There are at present on the Great Lakes some thirty self unloading ships of various designs, each handling an average of over one-half million tons annually; a total movement of self unloading vessels of some 15 million tons.

The ability of the self unloading vessel to discharge at speeds of from 500 to 2,000 tons per hour entirely independent of any terminal or dock facilities in part or full cargoes (vessels frequently delivering their cargoes in four compartment lots to four different discharging points) gives a flexibility to water transportation that was impossible before their development, and approximates car delivery by making such deliveries at the nearest water point to the point of actual consumption of the materials, putting materials into a large dock stock pile from which it can be used to service the construction jobs, or delivering directly into railroad cars or trucks for immediate reshipment.

In addition to the self unloading ships which load their cargoes from shore plants and use their own equipment simply for discharging, there are a number of vessels, including four with our equipment, which load themselves with sand and gravel by use of a dredging pump installed on the ship itself. The motive power used for a self propelled vessel, either steam, direct drive diesel, or diesel electric, is of more than ample size to handle the loading and unloading operations. Dredging pumps can be driven by steam from the ship's boiler or directly from the forward end of one of the ship's propelling diesel engines, or by motor from the central ship's electric generating plant. The sand and gravel dredging vessel, therefore, becomes a complete self contained plant with one primary power plant operating twenty-four hours per day, loading the ship, propelling it, and discharging the cargo, giving the maximum production per dollar of investment in power plant equipment, of any known type of water produced sand and gravel. The ship's crew, being on continuous twenty-four hour service in shifts or watches, handle the entire operation and are at all times under the responsible directing head—the ship's captain.

On account of the ample power supply, large size dredging pumps are used, generally 18 or 20 inch, which will load a 2500 ton cargo of sand or gravel in from three to six hours. The speed of propulsion varies from 10 to 12 miles per hour and the unloading time from 3 to 6 hours, which gives a very high production tonnage for this self contained unit, and at the same time, great flexibility both in selecting the point at which to obtain cargoes and also the place of delivery. Where the vessel is producing two or three kinds of sand or gravel, it is sometimes necessary to go to pumping grounds many miles apart for different types of material.

This unit, instead of being tied down to one dredging point like the ordinary suction dredge, can rapidly change the loading point to secure materials required in the trade, and also can operate in exposed waters, riding at anchor and dredging in water up to 75 feet deep in considerable sea during rough weather.

Flumes, with various size screen bars and other screen devices, are used for grading the material, and the writer has a patented settling box system which is used for dewatering the sand or gravel before putting it into the ship's cargo hold. Boats not equipped with the dewatering system, of necessity must have reduced size cargo boxes which are water tight and permit the surplus water to overflow above the loadwater line of the vessel.

The self unloading feature permits the unit to select the point of discharge and unload any part or all of the cargo at any selected point. The compartments also keep the different grades of material separated.

Practically all of this development to date has been on the Great Lakes.

The field of use on the inland waterways and canals would seem to be even greater than on the Great Lakes due to the fact that the entire river frontage is sheltered from the weather for unloading purposes, and becomes a continuous harbor front. Large self propelled boats with their higher speed and their constant activity in both either loading or unloading, should be very efficient for the river haulage and production of concrete materials, increasing the probable length of haul from

(Continued on Page 89)

Two Small Denver Sand and Gravel Plants Have Different Unique Features

One Uses Drag Belt for Dewatering Sand the Other Produces 70 Yd. Per Hour With 3 Men

By JOS. C. COYLE

DENVER, Colorado, is essentially a "city of brick" and in many suburbs the construction of residences and apartment houses is continually under way. This is especially true of the southeastern section of town, which makes the location of a sand and gravel plant in that locality advantageous from the haulage angle. Then too, Cherry Creek, which traverses that part of the city carries an excellent grade of brick and plaster sand near the city limits.

The Apex Plant

These were some of the factors which led to the installation of a small but efficient drag line sand plant in August, 1928, by the Apex Sand & Gravel Company. Though producing only about 200 yards per day the plant requires only two men to operate it, and as the sand is of good quality it finds a ready sale, keeping 6 trucks busy hauling it away. Two grades of sand (brick and plaster) and pea gravel are manufactured. Little attention is given the pea gravel, although some of it is sold. The major part of the deposit is sand.

Drag scraper operating in pit of Apex Sand and Gravel Company

Front of Apex Sand and Gravel plant

Spraying upon grizzly, Apex plant

A ½-yd. home-made drag scraper was installed, operated with a 2-ton Ersted hoist and a Wagner 20-hp. electric motor. This conveys the sand from the bed of the stream to a 3-ft. by 8-ft. grizzly of 2-in. square mesh, placed over a small pit at the foot of a 30 ft. bucket conveyor (home made). Here a strong spray of water from a 2-in. perforated pipe dissolves the sand and carries it into the buckets, preventing overloading of the conveyor, which would take place without the use of water. A continuation of this pipe carries a portion of the water supply to the top of the conveyor, where it carries the sand through an Iowa Manufacturing Company 30-in. revolving screen which removes the pea gravel and any trash or mud balls. Water is supplied by a 2-A American Steam Pump Company motor driven centrifugal pump.

Drag Belt Solves Problem

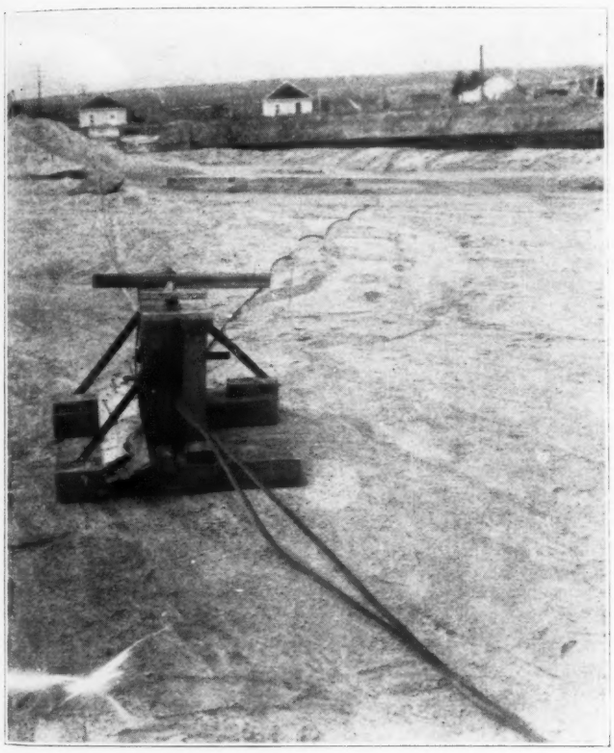
At first this screen and the 40 yard bins beneath it were the only dewatering equipment, and proved inefficient. Water pouring about the loading stalls softened the ground, soaked the truck drivers and otherwise hindered operations. Consequently a

Pump-shed at well, Apex Sand and Gravel Company, Denver, Colo.

Screening and sluicing plant, Superior Sand and Gravel Company

pair of loading bins were constructed on top of the creek banks some distance away and a home made drag belt, 14 inches wide, in an 18 inch flume with steel bottom, installed to carry the sand to the new bins, dewatering it on the way. This belt is 3-ply rubber, with 150 ft. centers and equipped with a 2 by 2 inch section of angle iron bolted to the under side every 18 inches. When the loading bins are full the sand is diverted to the stock pile through two dewatering openings in the drag belt flume.

The installation of this drag belt has solved the dewatering problem, according to J. A. Goodson, superintendent of the plant, as well as putting the finished product on top of the bank where the bins

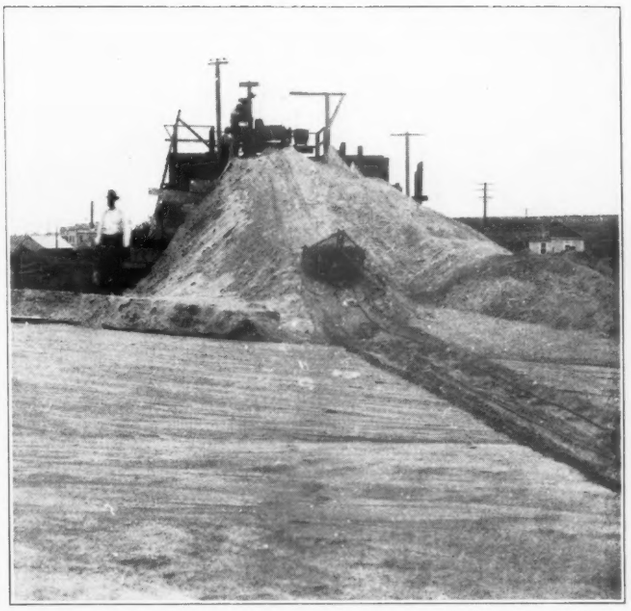


Adjustable sheave-frame at pit of Superior Sand and Gravel Company

are easily reached at all times with the trucks. The belt also separates the two grades of sand when the dewatering openings are in use, as the coarsest grade drops through, while the fine sand is carried on the belt to the end.

The Superior Dredging Plant

Though a comparatively small installation, there are features about the new hydraulic sand and gravel plant of the Superior Sand & Gravel Company, Denver, Colo., which should be of very general interest to men of the industry. Economy in installation and production is one of these features. The equipment used is not elaborate yet with three men, including the superintendent, the plant is capable of producing an excellent grade of brick and plaster sand, pea gravel and rock, at

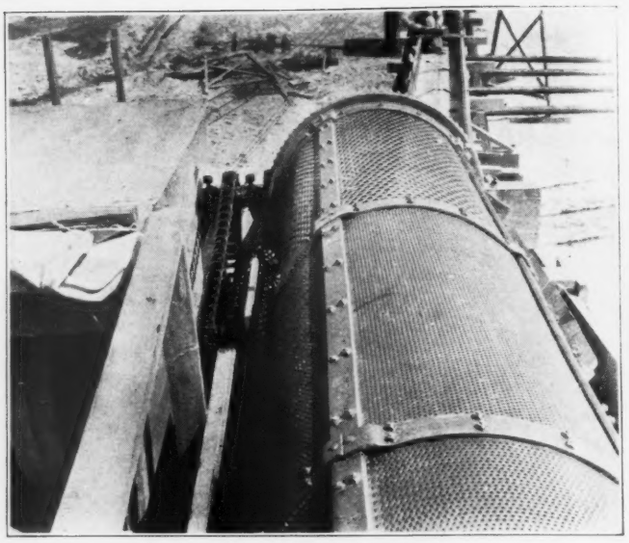


Part of storage yard, Superior Sand and Gravel Company, showing reclamation to loading bins

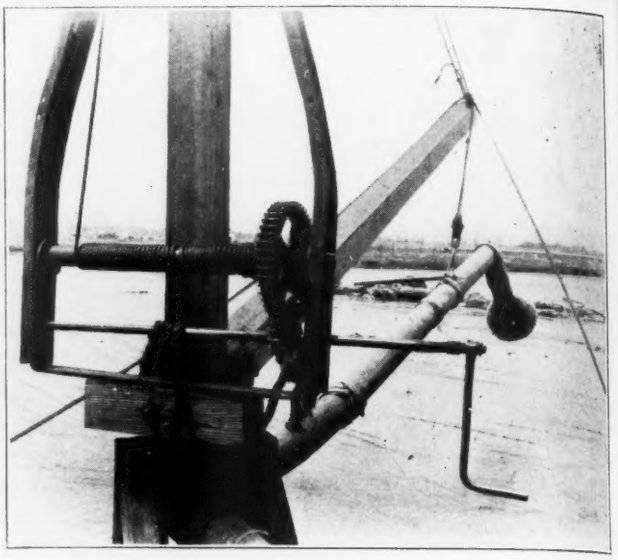
the rate of 70 yards per hour. This includes the reclaiming of sand from the storage yard to loading bins, and loading of trucks, which operations require the services of one man. Another man attends the pump on the suction dredge, while the superintendent looks after the screening operations and the plant in general.

The plant is the first successful hydraulic operation in Denver, and occupies a location on Cherry Creek where 20 acres of land has been acquired. Tests show the deposit of sand to be about 70 feet thick. Dredging operations were begun in the channel of the creek, some 100 feet from the screening plant. The boat is 16 by 26 feet, and carries an American Marsh centrifugal pump, driven by a 50-hp. General Electric motor. A swinging boom, 16 ft. long, carries the 6-in. intake line, which has an elbow, 3 ft. long, at the end, with a

Sand-sucker of Superior Sand and Gravel Company



Motor beneath housing at left drives this sizing screen at plant of Superior Sand and Gravel Company

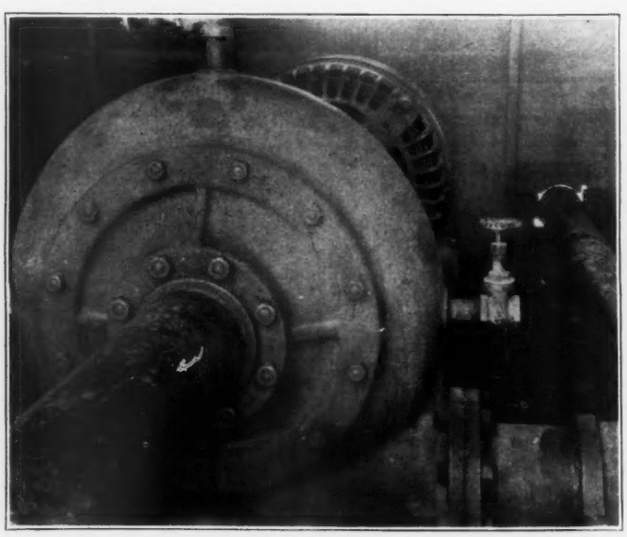


Crab and sucker, on barge of Superior Sand and Gravel Company

3 in. mesh of heavy wire over the bell end, which is 16 in. in diameter. The suction pipe has an insertion of rubber hose six feet long, near the boat, and is operated with a hand crab mounted on the end of the latter. Good results are secured to a depth of 50 ft. by extending the pipe. The flow of gravel secured with this equipment is limited only by the capacity of the 8-in. pipe which carries it from the boat to the top of the screening plant.

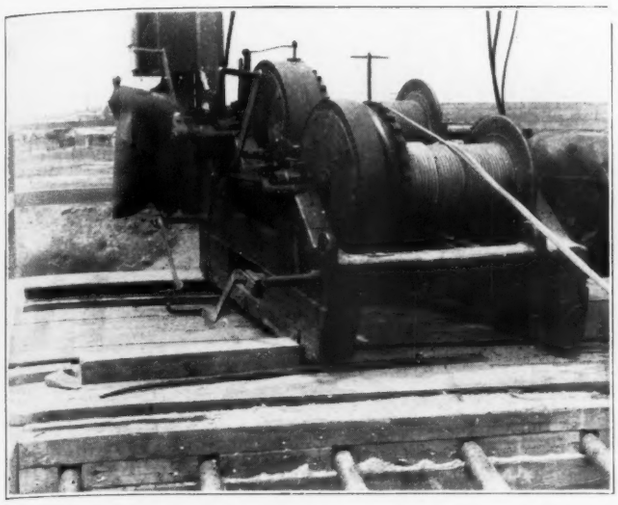
Here the sand and water pours into a wooden box, 3 by 10 ft., in the bottom of which is a 15-in. by 30-in. section of 3/16-mesh screen. This screen is for the purpose of reducing the volume of water before it reaches the sizing screen. This surplus water and its content of fine sand is carried around the end of the screen in an extension of the main 20 in. tail flume. The sizing screen, furnished by the Wilson Machinery Company is fifteen feet long and is driven by a 5-hp. Westinghouse motor in a small inclosure alongside the screen; 10 ft. of the screen has 3/16-in. perforations, the other 5 ft. has larger holes for pea gravel. A sloping sheet of metal under the finer section of screen carries the sand and water into the main flume at the side of the screen, while the pea gravel drops into a 120-yard bin, and the small quantity of rock contained drops through a chute at the end of the bins.

Besides the flume itself five 5-in. cast iron pipes are used in diverting the flow of water and sand to the stock pile. These are inserted in the side of the flume, and are extended at times when necessary to reach farther. Five elbows of the same sized pipe are also inserted in the bottom of the flume, (with provision for covering) for dewatering purposes when necessary. The field bunker, or storage yard holds approximately 25,000 yards of sand, and is enclosed on two sides with a five foot fence of heavy plank, held in place by wood piles.



Direct-connected centrifugal pump on Superior Sand and Gravel Company's dredge

Screen at head of sluice-boxes, Superior Sand and Gravel Company



Hoist adjusts itself to the angle of pull at Superior Sand and Gravel Company's plant, Denver, Colo.

At one end of this yard the loading bins, holding 70 yards, were built, with a strong platform at the back for the American two drum hoist which operates the Cress & Powers ¾-yd. drag scraper in reclaiming from the stock pile. The hoist is driven by a Fairbanks-Morse 25-hp. motor, and is mounted on two steel rails. A heavy V-shaped steel bar, bolted to the back corners of the hoist base serves to anchor the hoist to a large bolt at the back of the platform. This bolt in turn is held firm by a strap of ¾-in. by 3-in. steel, bolted into the floor and bowed up in the middle. By this arrangement the weight of a loaded scraper automatically swings the hoist to face whatever section of the storage yard is being worked off. The steel rails on which the hoist rests are kept oiled for this purpose. Six sections of 3-in. metal pipe set in the top of the bins form a grizzly upon which to dump the scraper.

A ¾-in. anchor cable stretched across the back of the storage yard, and secured to dead men at each end, serves to anchor a specially constructed tail sheave, by means of a double steel adjustable cable from sheave to anchor cable. The double adjustable cable passes around a sheave wheel in the large wooden frame shown here, which also contains another sheave for the tail line. Thus, by simply moving the double cable on the anchor line, the sheaves adjust themselves to any angle of the yard when a strain comes upon the tail line.

Arrangements have been made for the distribution of the output of the plant on a custom basis, according to C. W. Edwards, superintendent, which eliminates the necessity for a truck fleet and limits the labor personnel to himself and the two employees.

Properties of Cast Stone

The compressive strengths of cast stone in the form of 2-in. cylinders, 2 in. long, have been found by the Bureau of Standards to vary within wide limits with an average value of 6,250 pounds per square inch.

On account of the increasing use of this product as a building material, there is a demand for knowledge of its physical properties, more particularly the resistance of weathering, so that acceptance specifications may be intelligently written. While freezing resistance as a measure of durability is a most important property, the bureau believes that it would be impracticable to have such a requirement in the specifications. Determinations of those other properties, such as strength, and absorption, which can be made in a short time, and may possibly indicate freezing resistance, have been made to discover any possible correlation between them and freezing resistance. The freezing tests have only been partially completed, but results varying from complete destruction by 25 cycles to no sign of disintegration at 500 cycles have been obtained.

Self-Unloading Boats

(*Continued from Page* 84)

the best sources of material many times over the tow boat and barge method.

The operations on the sea coast are largely similar to the Great Lakes, and the ability of these vessels to dredge materials exposed to sea action which cannot be safely handled with the stationary dredge, should increase their usefulness.

One of the building materials which has been expensive to transport in bagged form due to the handling cost, is cement. Bulk cement is now being handled in self unloading vessels of various types and unloaded directly into silos, either with conveyors or a Fuller Kenyon pump system on the ship.

Our tunnel scraper system is now being used in ships handling cement and which are also handling other cargoes such as sand, gravel, stone, etc. The tunnel scraper system is used simply for collecting cement through the cargo hold, and the elevating may be done either by belt conveyor, where it is designed to handle material other than cement; or by Fuller Kenyon pump system, where the boats are engaged exclusively in cement handling, pumping the cement up into silos on the dock.

We believe that the self unloading boat will be a boon to the building materials industry throughout the country's waterways as it has been on the Great Lakes, rendering new deposits available and opening up new markets for deposits now being operated, by reducing the haulage and unloading costs to new markets. Plant operators on waterways would do well to analyze the possibilities of the self unloading boat, not only in connection with present markets, but also to determine new markets that might be reached by this method of transportation.

Hydraulic Dredging and Hydraulicking

By GEO. B. MASSEY

THE development in hydraulic dredges during recent months has consisted of the improvements in centrifugal pumps, the increased application of diesel engines and the adaptation of the dredge to the work so as to take advantage of the desirable features and avoid the undesirable features of the hydraulic type of dredge.

The desirable features, for sand and gravel recovery, are:

1. Elimination of over-size material at the excavating site.
2. Fairly steady and constant delivery.
3. Delivery at a distance, if desired.
4. Low labor cost for excavation and transportation.
5. Washing and scrubbing effect in pipes and pump.

The undesirable features are:

1. Excess of water delivered at treating plant.
2. Excessive power cost for delivering at a distance or at a much higher elevation.
3. Not so steady an output as a bucket ladder dredge.
4. Excessive abrasion when handling sharp materials.

As on the average size of hydraulic dredge, it requires the same power to transport the material twenty feet in a horizontal direction that it does to raise it one foot, numerous combinations have been tried to obviate the necessity of raising by the hydraulic dredge.

These combinations include a large dewatering bin at a low elevation, the dewatered material being raised by a clam shell bucket or by a bucket elevator.

Another solution is afforded by the dredge in the illustration, which excavates gravel and discharges it under a cableway excavator which picks it up and delivers it at the high elevation required by the treating plant on the bank of the river. This plant is equipped with a Swintek ladder which leaves the over-size material at the digging site. The discharge of the gravel onto the gravel bar made by the discharge pipe of the dredge allows the gravel to be retained while the sand and lighter material will be carried away, so that we have a mechanical elimination of over-size and a hydraulic elimination of under-size by the hydraulic dredge itself.

Plants are also in use where the elimination of undersize or a certain amount of grading or sizing takes place on the dredge itself. This treatment includes shaking screens or revolving screens. The illustration shows the revolving screen on the upper deck. In this case, over-size and under-size can both be eliminated by the revolving screen on the dredge.

With electric dredges, the main pump, winch, cutter head and priming pump are all driven by individual direct-connected motors.

On a diesel engine dredge, it is of course, impracticable to have a diesel engine direct-connected to each unit.

Dredge on steel pontoons, with monitor on the bow

The alternatives are: (in the order of their first cost)

(a) To drive a generator with the diesel engine, with motors on all units.
(b) To drive the main pump by a diesel engine direct-connected and have an auxiliary diesel engine driving a generator supplying current for all auxiliaries.
(c) To drive the main pump with a direct-connected diesel engine which also drives a generator supplying current for the motors on all of the auxiliary units.
(d) To drive the main pump with a diesel engine direct-connected and also drive a countershaft through a speed reducing mechanism. The countershaft delivering power to all auxiliaries by some type of gearing, usually belting.

In the last two cases, it is desirable to be able to run the auxiliaries without the main pump and some sort of a clutch becomes necessary between the diesel engine and the main pump. In the range of horse powers used on hydraulic dredges for running the main pump, a large and heavy clutch would be necessary.

A very effective clutch for this purpose is the Cutler-Hammer electric clutch illustrated. The engine fly wheel, the generator, the exciter and the outboard bearing are shown at the left of the clutch and the main pump, pump bearing and shaft coupling at the right. The relatively small size of clutch is evident in the illustration.

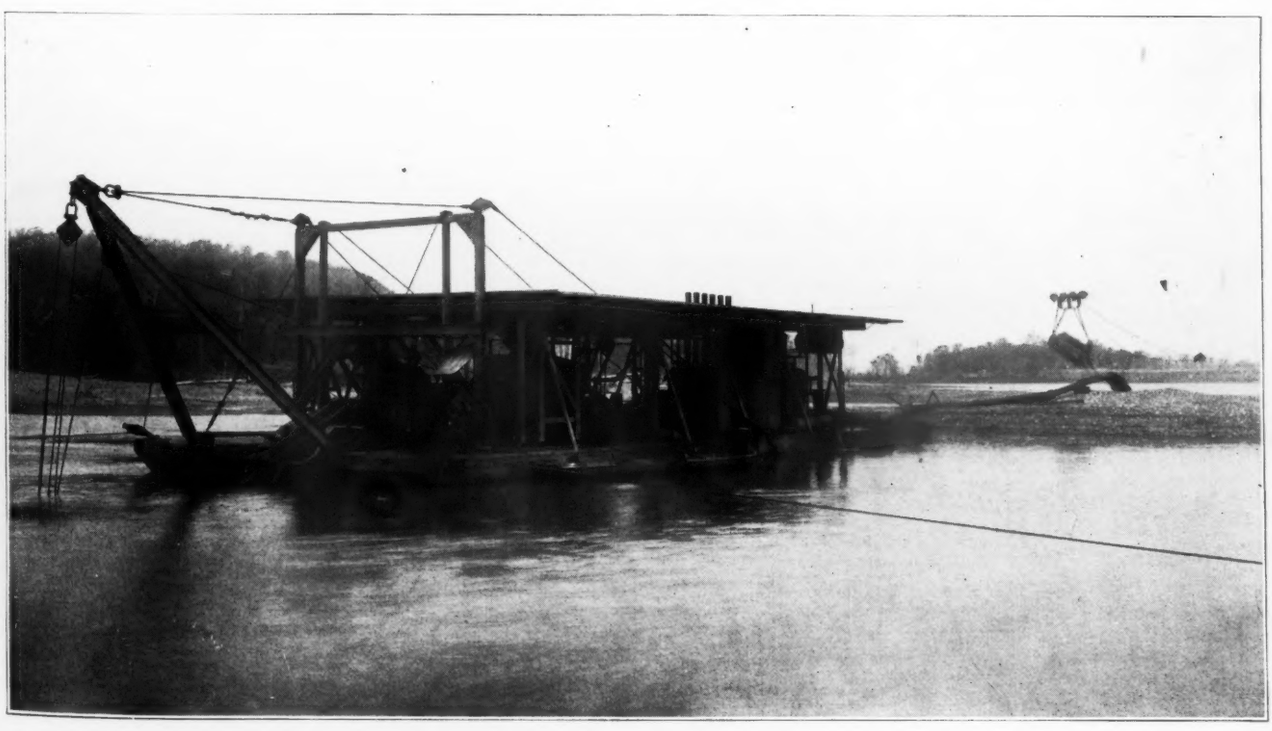
Hulls are more and more of steel of two types; one all in one piece and the other made up of cylindrical steel pontoons laid athwart-ships side by side and supporting a steel framework on which all machinery is mounted. This makes a comparatively cheap hull with a long life and it can be moved about more easily. It is possible to adjust the location of the tanks so as to adapt the bouyancy to the loads and so obtain a good trim.

Rubber cutless bearings are being used now as dredging pump bearings and also for cutter head bearings, both of which are subjected to the deadly wear of sand and water.

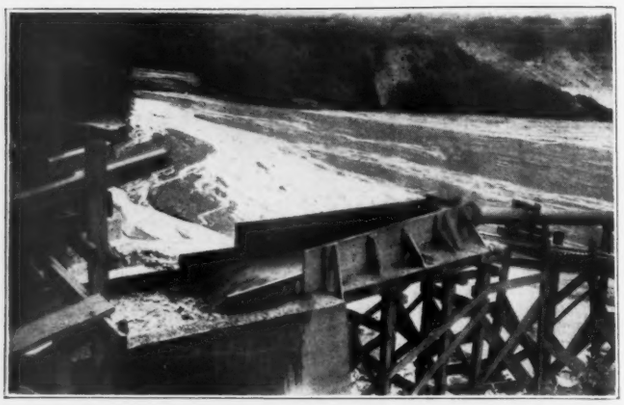
Dredging pumps are being built and used which are as efficient as clear-water centrifugal pumps were until recently. This is largely due to judicious use of properly designed clearance rings. Manganese shell liners are in one piece with no lugs or flanges, easy to cast and with a smooth inner surface so as not to encourage pits.

Renewal of discharge pipe lines is one of the serious outlays in hydraulic dredging. The abrasion is confined largely to the bottom thirty per cent of the circumference so that the pipe can be turned twice after wearing thin on one side. It is only a question of time, however, when holes appear and the whole piece of pipe has to be taken out. Through experience in the use of wrought iron in various types and services it has been learned that wrought iron pipe will be less affected in this way than steel pipe.

Ordinarily, one might be inclined to have opinions just opposite to what has been found by actual experience, because wrought iron is a softer material than steel. We are not certain just why wrought iron will excel other metals in this respect, but we are rather of the opinion that the hard siliceous slag filaments have a direct bearing; for instance, in the oil industry all the field men who have had experience in pumping of wells, especially the deep ones as found in the Oklahoma and Texas fields, know that wrought iron pipe will withstand the abrasion or rubbing action of the sucker rod against the inside of the tubing much



Hydraulic dredge depositing material under a cableway



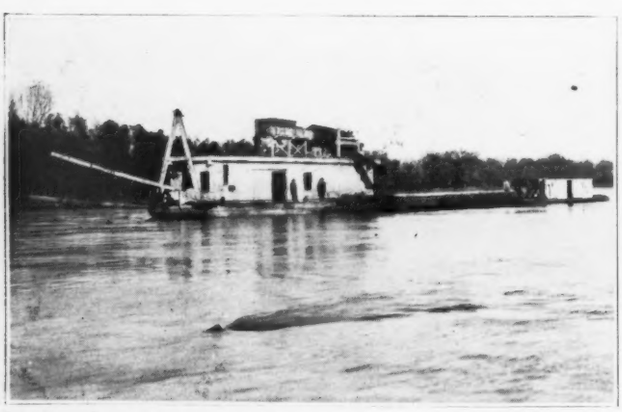
Dewatering tank for discharge of 12-in. dredge

more effectively and give longer life than steel tubing.

Recently, a piece of wrought iron pipe was sent back to the laboratory after it had been in service in a sand line for a relatively long period of time. While the pipe had lost a great proportion of its weight and the wall thickness being only a shell of its former self, nevertheless the abrasion had gone most uniformly instead of wearing through in spots. This uniformity of wear we feel is also of vital importance in prolonging the life, for it will be appreciated that should a certain piping material wear through in spots after a relatively short period of time, it will prove unsuitable.

Perhaps the hard siliceous slag component of wrought iron spreads the wear rather than allowing it to localize much the same as it exercises this same effect in resisting corrosion. Regardless of the whys and wherefores, the importance to the user is that past experience shows in a most decided way that wrought iron will outwear steel from abrasive effects.

For large capacity, ease of moving about, low labor cost and elimination of oversize material at the source, the hydraulic dredge is almost ideal, especially when it is only called upon to discharge the material at a distance from the dredge and at a very low elevation, at which point the surplus water runs back into the pond and only the sand and gravel are elevated by means of a digging elevator.



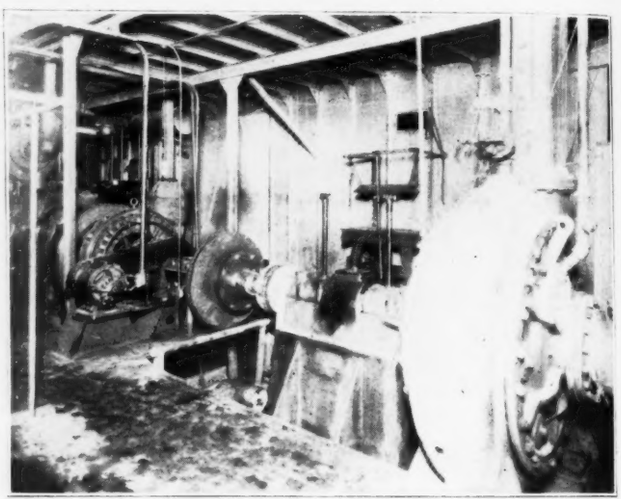
River type of hydraulic dredge with screen on upper deck.

As some of the material which is not refused on the dredge is too large for commercial gravel, this material is scalped out at this point, crushed and returned to the boot of the digging elevator. The material passing through the scalping screens is fairly dry and is elevated by a belt conveyor to the sizing and washing screens, from which it falls by gravity into the storage bins. This is more or less ideal supplementary equipment for the hydraulic dredge.

Where banks have a tendency to stand up straight and then cave, the ladder and suction pipe are apt to be buried and in some hydraulic dredges monitors are used which break down these high banks so that a large cave is not possible.

Hydraulicking

The efficacy of higher pressures in hydraulic excavation is being recognized in handling hard material. For instance, a four and a half inch



Showing 36-in. clutch between oil engine and dredging pump

stream under four hundred feet effective head can dig cemented gravel.

Such a stream requires about eight thousand gallons of water per minute which issues from the nozzle with a theoretical velocity of one hundred and sixty feet per second. The pressure, of course, is greatly in excess of the usual boiler steam pressures.

Most hydraulicking operations, except in the extreme west, have been carried on in easier digging material with lower pressures and smaller nozzles.

Electric rates are more reasonable and hydraulicking operations are an ideal load especially when they are carried on at off-peak periods, such as at night, thus not increasing the demand charge of a mill which operates in the daytime only.

As electric rates become lower, hydraulicking will increase, as it requires a large amount of power and a small amount of labor.

New Dredge of Florida Gravel Company Now Operating on Apalachicola River

THE Florida Gravel Company of Chattahoochee, Fla., conducts an interesting sand and gravel dredging operation on the Chattahoochee and Apalachicola rivers near that city. Both rivers are known for the quality of the gravel deposits forming their beds. The Chattahoochee and Flint rivers which both originate in Northwestern Georgia join, forming the Apalachicola rivers. This junction is a few miles north of the concrete bridge spanning the river on the Old Spanish Trail on which the city of Chattahoochee is located.

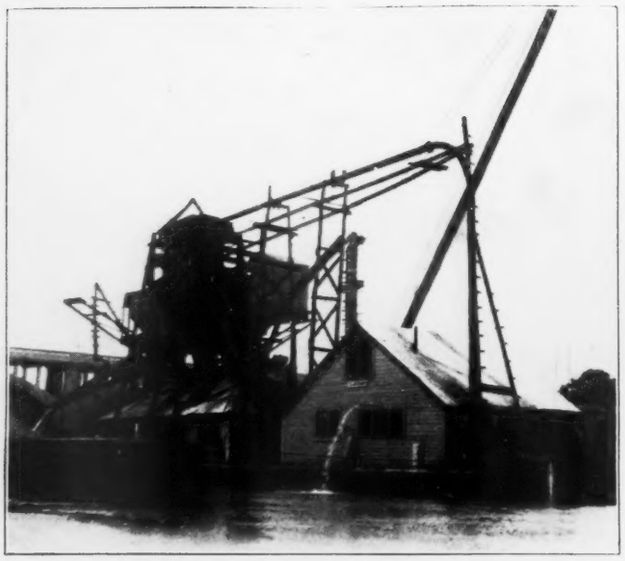
Operations are conducted for 35 miles up and down the rivers from this bridge and the shore plant from which shipments are made is on the east bank of the river below the bridge. The river is about 6 ft. deep normally and the deposits vary from 15 to 25 ft. in depth.

The previous dredge had caught fire from unknown causes on November 15, 1928, and was an almost total loss. Construction of the new dredge was begun immediately and it was recently put into operation. Luckily, at the time the dredge was destroyed, a large amount of material was in stockpiles on shore so that shipments could be made until the new dredge was completed.

The material was rehandled from the stockpiles by an American Hoist and Derrick Company 30-ton steam locomotive crane, using a 1½-yd. Owen clamshell bucket, into a hopper at the top of the plant. The material was fed from the hopper onto a stationary screen and a Perfect screw classifier. Cars were loaded from another hopper under the classifier for shipment.

Locomotive crane loading from stockpile to shore plant

Downstream end of dredge



Intake end of dredge showing dredge-line running along top

Tug towing barge under Old Spanish Trail highway bridge

The new barge is of a type peculiar to river dredging operations in the South. The entire operation of washing, screening and separating the gravel is performed on the dredge. The 10-in. Amsco dredge pump is operated by a direct-connected 170-hp. Bessemer Diesel engine. An 85-hp. Diesel engine of the same type drives a direct-current generator which furnishes power for all other operations. Wash water is furnished by two American Blower Company centrifugal pumps, the 10-in. pump being driven by a 40-hp. motor and a smaller pump by a 25-hp. motor.

The suction line is at the up-river or front end of the dredge and is handled by a stiff-leg derrick over the roof of the engine house. The derrick is controlled by a 60-hp. Clyde electric hoist. It can be swung in a full circle to handle machinery replacements on the dredge. A Mundy 3-drum hoist in tandem with the derrick hoist is operated by the same motor and handles the three shore lines which anchor the dredge in place. Broderick and Bascom "Yellow Strand" cable is used throughout.

The discharge line from the dredge pump rises vertically to the top of the boat where it then runs horizontal and discharges into a bin. The bin discharges both water and material over a distributing plate onto an inclined stationary screen. The major part of the sand passes through the screen

Loading cars at shore plant. Classifier at upper right

and through a chute to a settling box at the stern of the dredge. From this box it is loaded directly onto barges. The sand size is kept uniform in this box by a regulating device which can be adjusted to cut out some of the fines when in a fine deposit and vice versa.

The gravel passing the stationary screen discharges into a 48-in. Perfect Classifier which, in turn, discharges onto a Niagara double-deck vibrating screen which removes all of the remaining sand and divides the gravel into two sizes. The pea gravel is chuted to a barge on one side of the dredge and the large gravel to a barge on the other side.

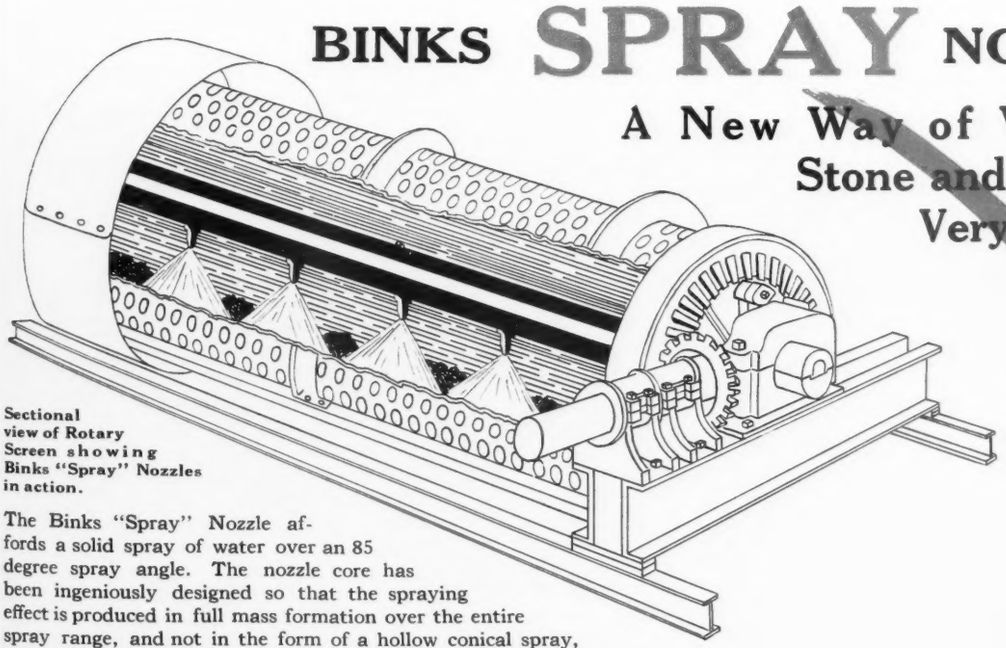
Three wooden barges are loaded simultaneously and are hauled one at a time to the short plant by a tugboat powered with an 80-hp. Bessemer diesel engine. A smaller boat is also kept in reserve for an emergency. On arrival at the landing the barges are unloaded directly into cars or stockpiles by the same locomotive crane previously described. A half-mile wooden trestle over the swamp which lines the banks of the river connects up with the Seaboard Air Line railroad over which shipments are made. The large gravel and sand produced are used for concrete work and the pea gravel for road dressing. Most of the product is sold to the state.

C. F. Mullen is president and treasurer of the company, Y. L. Watson is vice president and E. W. Scarborough is secretary. Mr. Mullen, who founded the company about 7 years ago, had retired from active control of operations several years ago but resumed his position at the beginning of this year. He also operates the Georgia Gravel Company at Columbus, Ga., about 200 miles further north on the Chattahoochee river.

The classifier

BINKS SPRAY NOZZLES

A New Way of Washing Stone and Gravel at Very Low Cost



Sectional view of Rotary Screen showing Binks "Spray" Nozzles in action.

The Binks "Spray" Nozzle affords a solid spray of water over an 85 degree spray angle. The nozzle core has been ingeniously designed so that the spraying effect is produced in full mass formation over the entire spray range, and not in the form of a hollow conical spray, thus producing a terrific washing or scrubbing action within the revolving screen or wherever installed.

Nozzle has no moving parts whatever, and is absolutely clog-proof. Made in all sizes to fit standard iron pipe thread ranging from 1 inch to 3 inches inclusive. Smaller sizes are also offered for special applications.

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Crushing.....C. H. Sonntag
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Elevating and Conveying .....C. H. Sonntag
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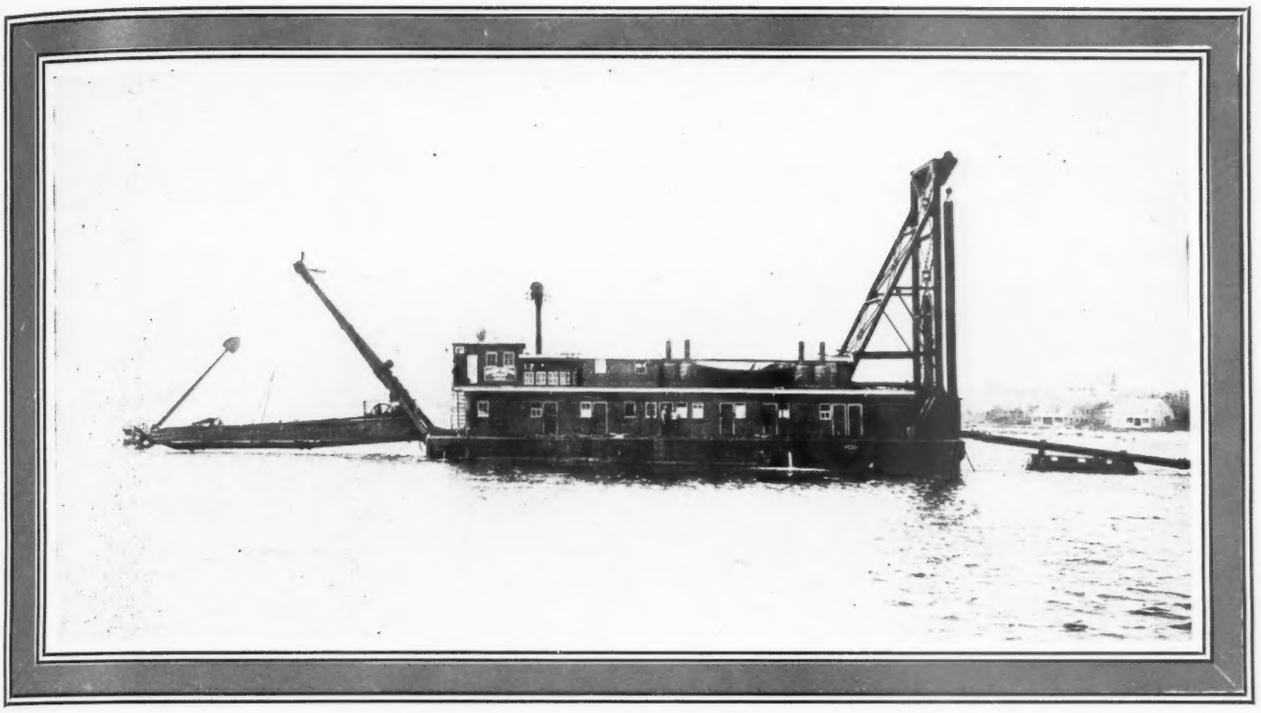

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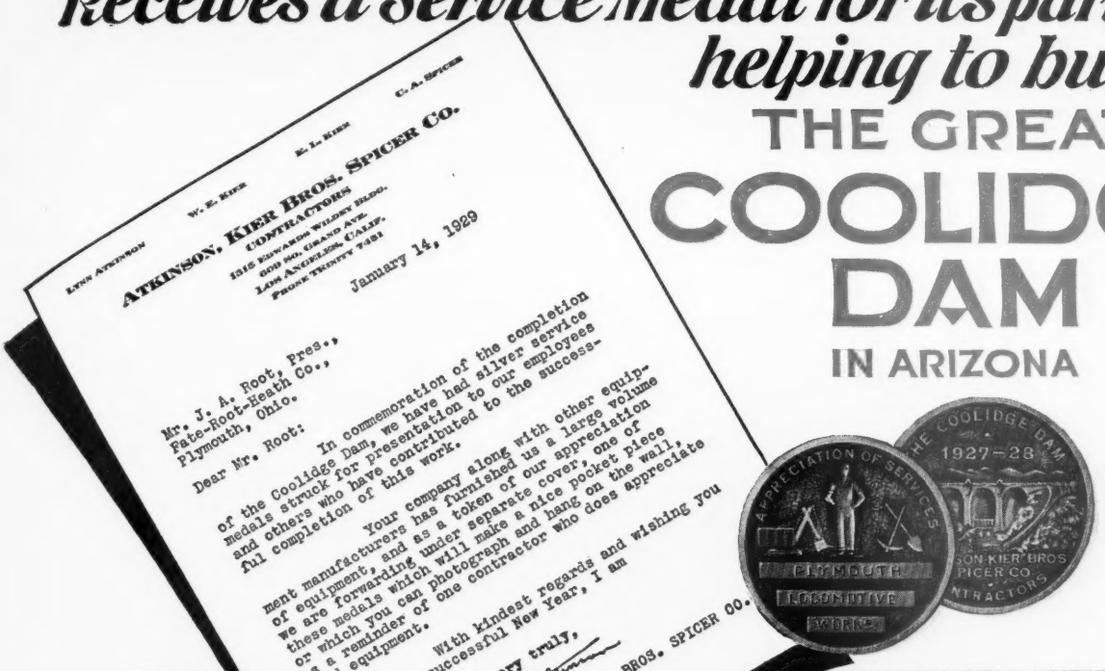
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January 14, 1929
Mr. J. A. Root, Pres.,
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Dear Mr. Root:
In commemoration of the completion of the Coolidge Dam, we have had silver service medals struck for presentation to our employees and others who have contributed to the successful completion of this work.
Your company along with other equipment manufacturers has furnished us a large volume of equipment, and as a token of our appreciation we are forwarding under separate cover, one of these medals which will make a nice pocket piece or which you can photograph and hang on the wall, as a reminder of one contractor who does appreciate good equipment.
With kindest regards and wishing you a happy and successful New Year, I am
Yours very truly,
For ATKINSON, KIER BROS. SPICER CO.
L&EJ
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PLYMOUTH LOCOMOTIVE WORKS
THE COOLIDGE DAM
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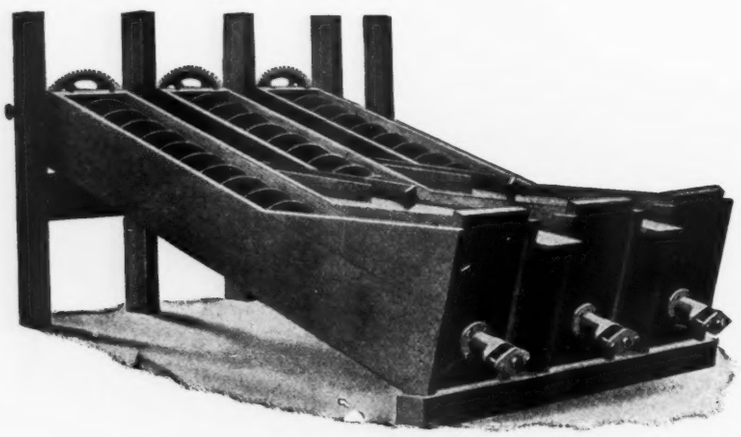

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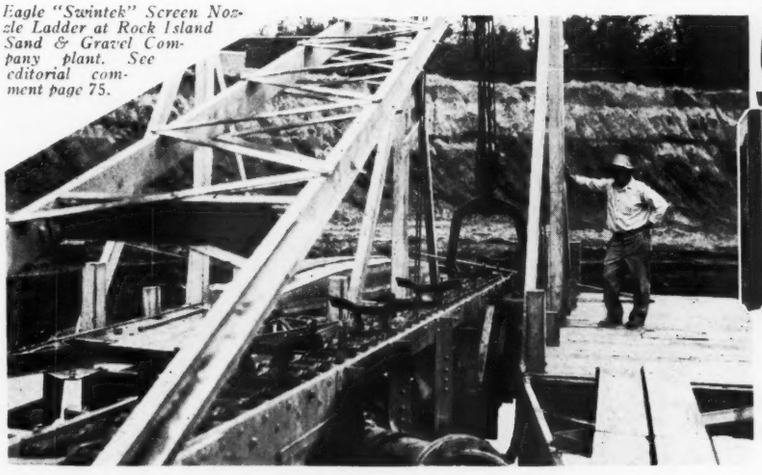
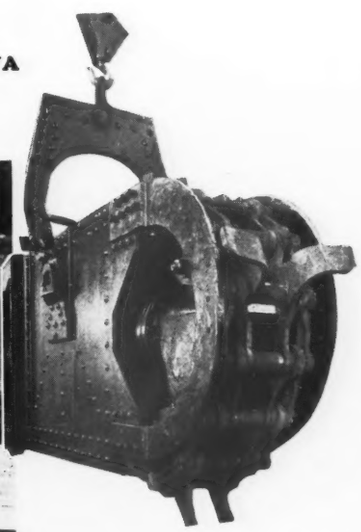
Eagle "Swintek" Screen Nozzle Ladder at Rock Island Sand & Gravel Company plant. See editorial comment page 75.





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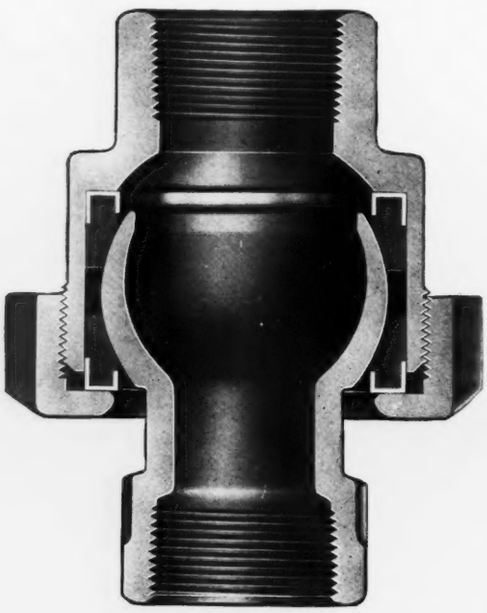
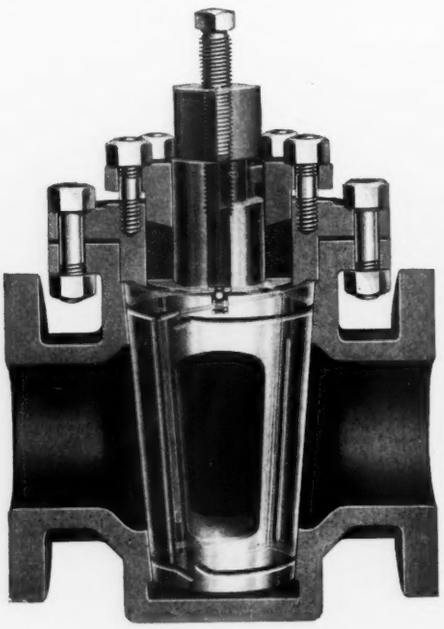
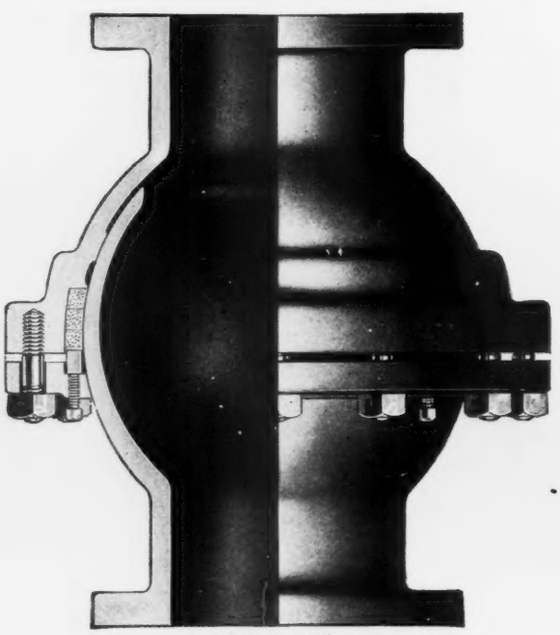


Sizes ¼″ to 6″
SCREW ENDS





Sizes 4″ to 48″
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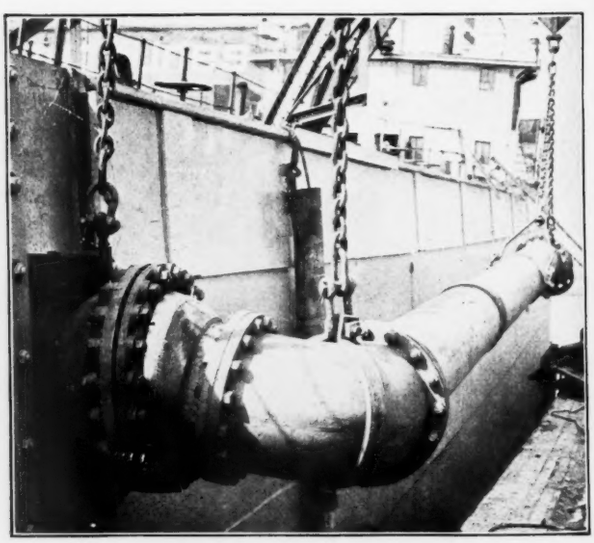

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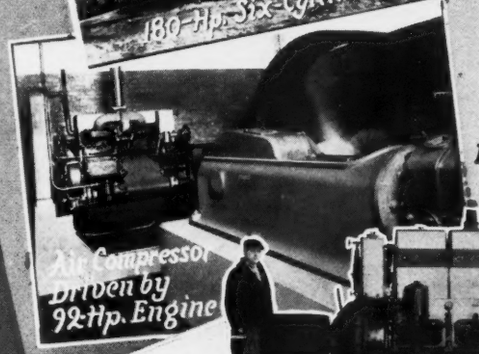

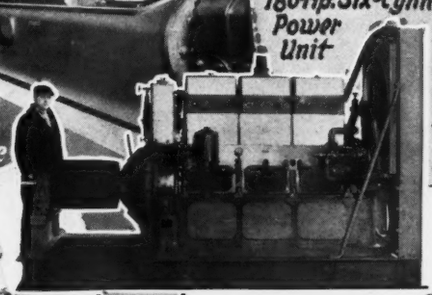

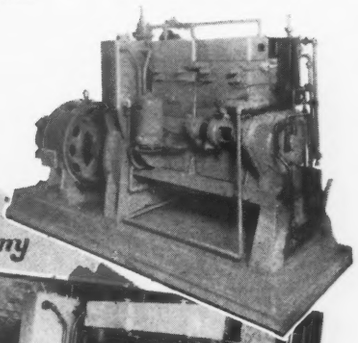

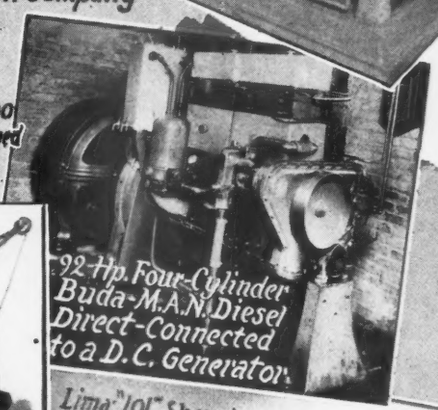

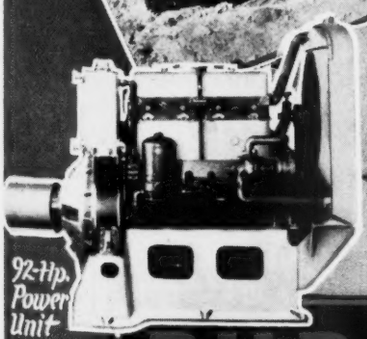

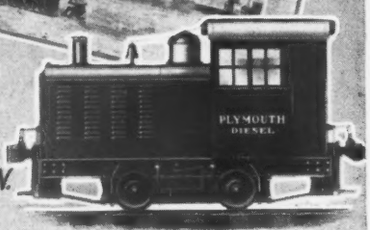

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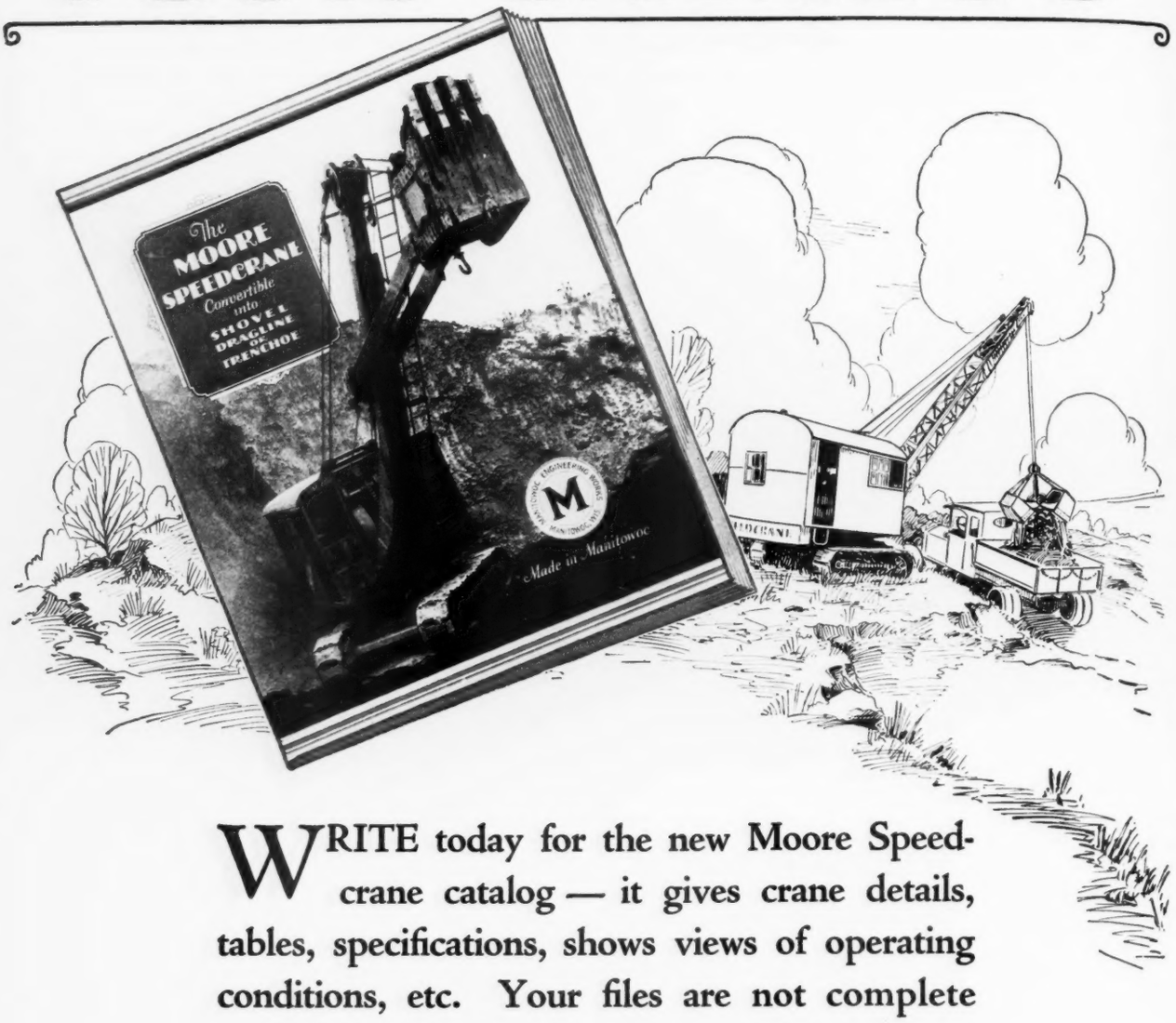

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NEWS FLASHES

Indiana Oolitic Purchased by Bloomington

Announcement was made in Bloomington, Ind., of the sale of the Indiana Oolitic Stone Company, which is owned by a group of Terre Haute men, to the Bloomington Limestone Company, the second largest stone corporation in the belt.

The price paid by the new owners for the Oolitic company was said to be $1,000,000, of which amount $100,000 was paid in cash and $900,000 in preferred stock. The deal has been pending for six months. With the Indiana Oolitic Company goes some valuable stone land yet undeveloped.

Plans for expansion and development of limestone and other quarries, with additional loading, conveying and kindred equipment are being formulated.

Rehearing for Limestone Set

The Interstate Commerce Commission has agreed to reopen the much discussed ground limestone rate case of the Virginias and has set September 10 as the day on which further testimony will be taken. The case is the one of the North American Cement Company vs. Sheriden and Rockfish Railroad Company et al., docket 19,943, Sub, No. 1, involving the Virginia intrastate rates on lime and ground limestone.

Fairfield Plant Operating

The plant of the Birmingham Slag Company at Fairfield, Ala., built to handle the output of two large blast furnaces at the Fairfield works of the Tennessee Coal, Iron & Railroad Company, recently began operations. This plant has a daily capacity of 2,000 tons, and embodies new features in engineering, construction and equipment. It comprises an office building, electric substation, screen house and loading house. Slagtex tile, manufactured by the company, were used in constructing the office and substation. The screen house has a structural steel frame and is enclosed with slagtex tile and a tile roof, the latter the product of the American Cement Tile Manufacturing Company. The loading house consists of a steel frame structure with sheet metal covering; the Ingalls Iron Works Company supplied the structural steel.

Parallel loading tracks are so arranged that the cars are removed by gravity at will. Above the plant is storage space for 100 cars, and facilities have been provided for handling an equal number below the plant. Cars may be loaded on either track. The slag is reclaimed from modified pits by a Marion electric shovel, and is carried to the crushing and cleaning plant in 40-yd. Sanford-Day bottom dump cars, equipped with motors operated by a third rail.

It is dumped at the crusher house into a Stephenson-Adamson live roll grizzly. The minus 1½-in. slag goes to the elevator and the oversize slag falls into a Symons crusher. After being crushed, the slag is elevated to the top of the screen house and discharged over a magnetic pulley to Traylor vibrating screens, so arranged that all slag larger than 1 in. may be diverted to a smaller crusher in the screen house and reduced. Under the screens are 14 bins for storing the various sizes. Bin gates may be automatically opened and closed by the operator in the loading house by which he is able to release the exact quantity of each size required onto a 48-in. conveyor belt. The belt runs over automatic scales and delivers the material to a washing table, from which it is loaded.

Travertine Company Incorporated

The Travertine Rock Company, a St. Petersburg, Fla., corporation, has just received its charter from Tallahassee, it was recently announced. The incorporators named in the application papers are Lee Roberts, attorney, J. Roy Dee and John G. Dee, all of the Sunshine City, Fla.

For some time, it was announced, the little group of investors interested has been conducting investigation of a tract at New Port Richey, out of which some fine samples have been taken. Many of these have been displayed in the city and interest in this new state resource, so thoroughly developed by the Johns-Manville Company southeast of Manatee, in Manatee county, where the company is now making shipments of the beautiful marble is growing on the West Coast.

The local company's ground under investigation is located not far from the colony at New Port Richey, which includes Tom Meighan, Gene Sarazen and others. The company has been excavating, and has begun blasting of the hard rock encountered. Nearby the rock of the New Port Richey deposit has been opened down a depth of 27 ft. now filled in with water, but it is said at that depth the quarrymen were still in the deposit.

The development work of the local company is under the direction of E. E. Miller, formerly associated in the operations of the Fitkin interests.

The new company has an authorized capital stock of $100,000. Many have wondered why the interest has so grown in travertine rock since the first deposit was opened commercially at Bradenton area. It is the price that has caused this interest. An acre of ground contains in round numbers about 43,300 sq. ft. so that a deposit if worked only for 3 ft. would show 129,900 cu. ft. The import duty on travertine rock, as has been recently published, is 65 cents a cubic foot. If only the import duty price of 65 cents a cubic foot were received for the product, an acre would show on the 3-ft. working a gross revenue of $84,425. The price for similar marbles and rock, according to marble companies, is somewhere around $3 to $4.

Company to Mine Feldspar

The Tennessee Products Corporation of Spruce Pine, N. C., will begin operations at two mines located on Cane creek, near Hawk, Ga., July 15. One of the mines, known as the "Russ Buchanan mine," produces number one soap feldspar, and the other, the Neal Wise mine, potash feldspar of the best grade.

The veins are very large at these two mines and the company will install modern mining machinery, electrically driven, and run these operations on a large scale.

Limerock Company Starts Shipments

Lew Parks of Manhattan, Mont., has secured a position with the Ingelside Limestone Company of Denver, Colo., which is opening a limestone quarry at Sappington, Mont. It has built a spur from the N. P. to the quarry, which is only a short distance, building an auto road to Sappington and erected offices and residences for those in charge, as well as quarters for the men. Some 60 days ago a big power line was extended from Willow Creek to the plant, which will be in constant operation.

Sherman Elected President Port Stockton Company

William Sherman has been elected president of the Port Stockton Cement Company of San Francisco, Cal. Mr. Sherman is president of the City National Corporation, the Merchants Ice & Cold Storage Company, and president of the Fire Commission of San Francisco.

Elected to serve with him on the board of directors are: Emory E. Smith, president Smith-Emery Company, chemical engineers; W. C. Stevenson, chief engineer of the company and formerly chief engineer for the Pacific Portland Cement Company, Yosemite Cement Company and the Pacific Coast Portland Cement Company; Charles H. Segerstrom, president of the First National Bank of Sonora; F. B. Hyder, mining engineer and formerly associated with D. C. Jackling; Joseph McInerney, and Alfred E. Roberts, consulting engineer and designer of several cement mills located on the Pacific Coast.

Vance Elected Vice-President of Monolith Midwest

R. L. Vance of the Denver office of the Monolith Midwest company was elected vice-president of the company at a directors' meeting held July 30 as was announced by Denver officials of the company. Mr. Vance, who has been 19 years in the cement business in the Midwest and Pacific coast territories, was an executive of the Monolith Portland Cement company of California before coming to Denver in April of this year. Through his election as vice president he will become a permanent resident of Denver and has recently moved his family to that city. Mr. Vance will have general charge of the Midwest company's operations, the purpose being to establish the closest possible contact with local condition, it was announced.

Lawrence H. Whiting Boosts Indiana Limestone

Indiana limestone quarries in Lawrence and Monroe counties are the largest of their kind in the world, Lawrence H. Whiting of Chicago, chairman of the board of directors of the Indiana Limestone Company, said in a recent address before the Rotary Club at the Claypool hotel, Indianapolis.

Mr. Whiting, who spoke on "The Indiana Limestone Industry," was introduced by Frederick E. Schortemeier, former secretary of state. Wives of the club members were special guests. A program of selected instrumental music was provided during the meal by the Turner trio.

The limestone industry is one of the oldest industries in Indiana, the first stone quarry having been opened in the state in 1840. The ninetieth anniversary of the starting of the first quarry will be celebrated next year. Today, the quarries in the two counties employ 8,000 persons, with an annual payroll of $12,000,000. Enormous amounts are paid annually by the quarries to railroads for transportation of limestone to all parts of the continent.

Mr. Whiting said the Indiana product is oolitic limestone, which was formed millions of years ago. The two counties, he said, once formed an inland sea which provided shells that settled to the bottom and formed the stone. This oolitic limestone is some twenty-seven miles long and four miles wide. The shells which formed the solid formation have been "curing" more than eighteen million years.

The only other places in the world where oolitic limestone is found are in Egypt, England, France and Scotland. Mr. Whiting claimed that Indiana limestone has proved to be of finer quality than that of foreign deposits.

Nearly every city in the United States and Canada has buildings constructed of Indiana limestone. Mr. Whiting named many large structures which have been built of Indiana limestone in some of the nation's largest cities. He cited the Indiana World War Memorial, new Scottish Rite Cathedral, Columbia Club and Chamber of Commerce building as some of the Indianapolis buildings.

Indiana limestone has been found to possess all of the fine and enduring qualities of marble and they are so similar that it is difficult for chemists to tell where marble leaves off and limestone begins.

Cause of Blast Unknown

A coroner's jury August 9 was unable to fix the cause of an explosion that occurred on August 3 which killed seven men and wrecked a $12,000 steel oil barge on the Ohio river at the plant of the Kosmos Portland Cement Company at Kosmosdale, eighteen miles south of Louisville, Ky.

The jury heard testimony from witnesses that lightning flashes preceded the explosion and that an acetylene torch was not being used in repair work at the time of the blast, but a reamer was used and could have caused sparks sufficient to ignite the gas and oil inside the tank.

The verdict read, "Accident was due to explosion of gas and oil from unknown causes." The victims, who were repairing the barge when the blast occurred, were William Wilberding, Allen Sauer, Leslie Underwood, Murray Jockell, O. Jupin, C. Skeeters and Frank Reader.

Florida Man Is Named Lime Company Chemist

Leon F. Fernald of Tarpon Springs, Fla., has been named chemist for the Arkansas Lime Products Company at Texarkana, where the company's laboratory is located. The company has two mines near Marianna, Fla., one in Alabama and extensive mines and other equipment in Arkansas. Fernald will have charge of all chemical analysis and research work for the company. He has recently returned from Texarkana and is now selecting and ordering equipment for the laboratory.

Fernald is a graduate of the University of Florida in the class of 1928 and since then has been a graduate assistant in the university's department of chemistry.

Arizona Company Improving Recently Acquired Plant

The Arizona Rock Products Company, which recently took over holdings of the Southwest Sand and Gravel Company of Tempe, Ariz., is now installing machinery which will increase the present capacity of the plant 700 tons per day, and will soon begin construction of its new plant, which will have a capacity of 2,000 tons per day.

Officer of Company Optimistic

S. W. Storey, vice president of the Florida Portland Cement Company, who was in Tampa, Fla., for a summer visit and inspection of the company's plant on Sparkman bay, brought a message of confidence in his bright outlook for future business in Florida.

To interviewers Mr. Storey stated, "Our company has no doubts as to the ultimate future of our business or the future of the state. We are dependent entirely upon Florida consumption, and this is steadily increasing. The plant here has produced 100,000 barrels more this year than last, and construction work ahead has caused us to anticipate still greater increases."

New Stone Quarry Opened Near Bloomington

Jack Bennett has completed the work of removing 7,000 yd. of dirt from what was formerly the Pearl Neeld farm southwest of Bloomington, Ind., upon which the Furst-Kerber company has opened a stone quarry. Mr. Bennett also built a railroad switch into the property.

Stone and Gravel Companies to Merge

Merger of the Service Rock and Gravel Company and the Grant Rock and Gravel Company, two of the largest organizations of the kind in the San Joaquin Valley, Cal., was announced by H. M. Estes, president of the latter organization. The merger which became effective on August 1, involves more than $750,000. The consolidated plants are located on the San Joaquin river, one at Friant and the other at Rockfield.

Directors of the Service company are Fresno, Cal., men, while directors of the Grant company include A. H. Hills, H. G. Hills, Bruce Heathcote, Frank B. Peterson and J. S. Humberg, all of San Francisco, and Estes. Headquarters of the new concern will be located in Fresno, Cal.

Additional Lime Kiln Planned

A new industry has been announced for Scurry County, Tex., with the purchase by J. T. Bulmer of Dallas, one-half section of land north of Fluvanna from J. E. Jones for the establishment of a lime kiln. The rock in the land that was purchased is exceedingly rich in lime and includes more than a mile of the cap rock.

To Develop Quarries in Owl Cannon

Work on the extension of the Ingleside branch of the Colorado and Southern Railroad company to the new lime quarries in the Owl cannon region, Colo., has started, according to announcement made by C. S. Northup, local agent. The work is expected to be completed by December 31.

The quarries are about 2½ miles by direct line from the present terminus of the branch and the extension will be about 4¾ miles long. The estimated cost for the work will be approximately $100,000.

A permit for the extension was granted the Colorado and Southern company by the Interstate Commerce Commission at Washington the latter part of June, and since that date, surveyors have been busy in preparation for the actual work.

To Work Marble Deposit

A $250,000 corporation has been formed to work the recently located marble deposit on a 50-acre tract, formerly known as the W. S. Needham farm at Powder Springs station on the Middlesboro branch of the Southern railway, two miles from Knoxville, Tenn.

A member of the North Hills realty company of Knoxville was inspecting sheep on the Needham property in April when he noticed an unusual outcropping of marble. He reported it to other members of the firm. Samples of the marble were brought to Knoxville, polished, and found to be of exceptional quality.

The marble lies in what is known as the Luttrell belt. It contains five strata which range in color from dark cedar to light gray. No effort will be made to mill the stone. The company will confine its efforts to quarrying and selling the product in blocks.

Officers of the company are W. A. Cockrum, president; Howard Edelen, vice president; W. J. Sterchi, second vice president; C. R. Fielden, secretary-treasurer; directors, C. K. Vance, G. T. Fielden and Whiting, Newell.

Explosion and Fire Cause Heavy Damages

During the early morning hours of August 7, the crusher building of the Higby sand works located in the vicinity of Utica, N. Y., was totally destroyed by an explosion followed by fire. The loss was estimated at $15,000 and one workman, Samuel Hallatt, of Utica, was badly burned. The cause of the explosion was not learned save that it was an air compressor engine which had just been started by Hallat for the day's work that exploded.

American Aggregates to Construct a New Unit

Operations for the construction of a new unit to the American Aggregates Corporation to be used as a distributing point for truck delivery of sand and gravel exclusively are under way adjacent to the old Granite Sand and Gravel plant located south of Raymond street, Indianapolis, Ind.

The new plant will be equipped with vibrating screens and gyratory crushers. The capacity of the plant is estimated at 2,000 tons daily, according to C. Gray, district manager of the company.

The new unit is being erected to take care of increased business and to provide adequate facilities for winter operations. Material will be pumped direct into the plant, and it will be so equipped that a force of five men will be sufficient for its entire operations.

First deliveries were recently made from the new distributing point leased by the company from the Casady Fuel and Supply Company, located at Tenth street and the Belt railway. Deliveries of materials in Indianapolis will exceed one-half million tons for 1929, according to Mr. Gray.

New Moulding Sand Plant

Eugene W. Smith, Jr., is constructing a mixing and loading apparatus for moulding sands at the Kensington station near Rockport, Ind., on Dr. O. P. Goldman's farm. Mr. Smith is being assisted by the consulting services of his father, Eugene W. Smith, Sr. The moulding sand company is to be known as "Eugene W. Smith, Incorporated, of Evansville." The senior member has been connected with foundry work in one plant for fifty-four years and is an authority on moulding sands. The plant will employ approximately 30 men and the mechanical end will consist of a mixer, loader and testing laboratory.

Utah-Idaho Cement Elects Officers

Chapin A. Day, president of the Utah-Idaho Cement Company of Ogden, Utah, was re-elected at a recent meeting of the board of directors, held in the company's office. Other officers elected were: Harold C. Day, vice president and general manager; Ralph E. Bristol, secretary and treasurer; C. R. Hollingsworth, assistant secretary and treasurer. These officers, with Florence Day Bristol and Ruth M. Day, make up the directorate.

Consumers Acquires Control of Wisconsin Lime

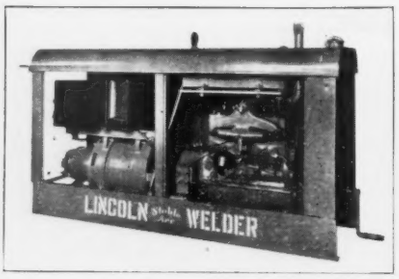
Control of the Wisconsin Lime and Cement Company recently passed to the Consumers company. Details of the deal were not disclosed, but it is understood to have involved a substantial cash consideration. This deal will make the Consumers company a dominating factor in the building materials market in the Chicago territory, with the thirteen yards of the Wisconsin company.

The Wisconsin company, as of December 31 last, had total assets of more than $3,000,000. Profits for the year ended December 31, 1928, amounted to $250,255 after depreciation, interest and other charges but before federal taxes. It is understood that there will be no change in the management of the Wisconsin company as a result of the change of control.

Banner to Enlarge Plant

Construction of another addition to the recently enlarged plant of the Banner Rock Corporation of Alexandria, Ind., is under way. The force now numbers about 750 and the weekly pay roll is $35,000.

NEWS OF EQUIPMENT MANUFACTURERS



Gas engine driven welder

New Gas Engine Driven Welder

The Lincoln Electric Company has recently introduced to the trade a new model gas engine driven welder for use where electric power is not available. The new model welder is of 200 amperes N. E. M. A. rating and is powered by a 4-cylinder Waukesha engine, operating at 1,500 r.p.m.

The latest improvements which are featured in the new improved models are included in this new model. An automatic idling device is incorporated which reduces the speed of the gas engine, when welding operations cease and accelerates the engine to proper speed, as soon as welding is started. It is estimated that this automatic idling device will reduce fuel consumption approximately 25 per cent, as well as considerably reducing wear in the welder which will permit longer life of the equipment. Another feature is the complete protection afforded the machinery by the welded steel canopy which totally encloses the outfit.

Russia to Have Large Gravel Plant

Orders have already been confirmed for shipment to Russia of complete equipment for the largest gravel plant outside of the United States. The contract which calls for ten carloads of machinery at a cost of nearly $50,000, was awarded to the Smith Engineering Works by the Amtorg Trading Company. The gravel plant, which will furnish material for the construction of an 80,000 k.w. hydro-electric plant near Leningrad, will be placed in operation next spring. The Smith Engineering Works expect to have the machinery completed for shipment about October 1.

Not only is this the first gravel washing plant of any magnitude ever shipped into Russia, but it is unique in several respects. The material will be brought to it in hopper dump cars; and track hoppers are provided so that a trainload of material can be dumped at once into the plant without requiring manual handling. The outfit will consist of two complete, identical units and each unit will be capable of handling 300 cu. yd. of gravel per hour.

The diamond hose clamp

R. B. Marshall Joins Chain Belt

Robert B. Marshall, well known conveyor sales engineer, has joined the Chain Belt Company's Conveyor Division with headquarters in the New York City office. Mr. Marshall has spent the past 21 years in the conveyor business. W. H. Quinn is the New York district manager for the company.

F. D. Soper New Head of LaFrance-Republic Factory

F. D. Soper has been appointed vice president of the LaFrance-Republic Sales Corporation, and general manager in charge of the operation at the Alma, Michigan, plant, according to an announcement by C. B. Rose, president. Mr. Soper has already assumed his new duties at Alma, and has established his residence at that place.

Clamp for Suction Hose and Dredging Sleeves

The W. H. K. Bennett Company is manufacturing a diamond hose clamp especially for sand and gravel dredge operators. It is built strong, is of simple construction and can be clamped around any suction hose or dredge sleeve from 6- to 15-in. in diameter. It clamps uniformly around the hose, making an air-tight joint and requires no special tools for clamping.

American Hoist Opens Branch Office

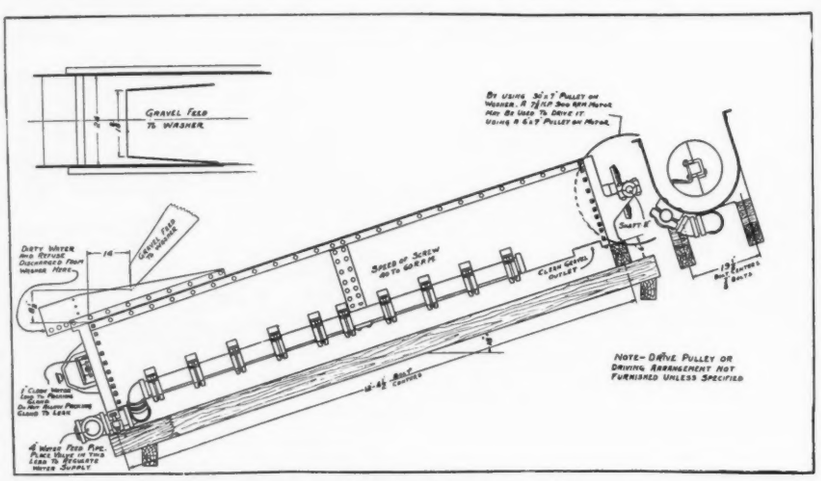
The American Hoist & Derrick Company has announced the opening of a branch office at 5800 Bingham Ave., Detroit, Mich. G. J. Heck, sales representative in that district, will be in charge.

New Manitowoc Dealer

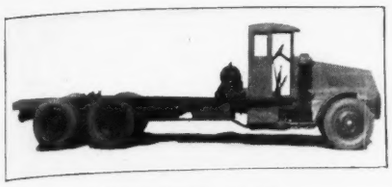
The Manitowoc Engineering Works has appointed H. E. Green, 505 Fox Building, Philadelphia, as agent for the promotion and sale of Moore speedcranes, shovels, draglines and trench hoes as well as Buffalo-Manitowoc clamshell buckets in Philadelphia, Maryland, and Washington, District of Columbia.

Good Concrete Requires Clean Aggregate

The above caption is used by the Eagle Iron Works as a title for a new illustrated 10-page bulletin, recently issued. This bulletin is concerned with discussing the cleaning of aggregate and the mechanical appliances used in a number of plants. It also includes photostats of letters from users of Eagle washers.


GRAVEL FEED TO WASHER
DIRTY WATER AND REFUSE DISCHARGED FROM WASHING HOPPER
GRAVEL FEED TO WASHER
SPEED OF SCREW 40 TO 60 R.P.M.
CLEAN GRAVEL OUTLET
SHAFT 8"
NOTE- DRIVE PULLEY OR DRIVING ARRANGEMENT NOT FURNISHED UNLESS SPECIFIED

An improved type of gravel washer



Super-Duty truck

Super-Duty Trucks Go Into Regular Production

Because the road speed necessary to meet the demands for rapid delivery service heretofore obtained by reducing load capacities, using pneumatic tires and higher gear ratios with existing engines has reduced the most essential element of hauling economy, which is capacity, Mack introduces the Super-Duty line of trucks, two models of which are designed to carry great loads at high speed.

According to a recent announcement, the AP 4-wheeler and the AP 6-wheeler will carry from 7½- to 10-ton truck loads at 30 miles per hour and climb 20 per cent grades with ease. They will haul 35-ton drawbar loads at 25 miles per hour. These massive AP trucks are powered by 6-cylinder high compression engines of 150 hp.

Twenty-five miles per hour will generally equal the average speed of lighter vehicles so that the service element of speed is combined in the Mack Super-Duty line with the economy of great capacity.

In addition to the AP model, this line includes the AC model with a new high compression engine and six wheels. This vehicle is designed, not for speed, but for hauling heavier loads under the difficult conditions encountered in earth moving and other fields where the greater traction and better load distribution of six wheelers is recognized.

The most outstanding innovation in the model AP, is the six-wheel feature with rear, four-wheel drive. In this, Mack has retained its characteristic heavy-duty feature chain drive.

The rear truck consists of two dead axles mounted through rubber shock insulators to massive spring tips. The spring is anchored at its base to a horizontal torque bar mounted in the frame so that the load is equally distributed between the two rear axles. This distribution, which is the most desirable from a standpoint of road impact, can be obtained on these models because the tractive resistance of all four wheels is effective through four-wheel drive. The drive is effected by means of four sets of driving chains, each set of rear wheels driven by an independent jackshaft. Brakes on all rear wheels as well.

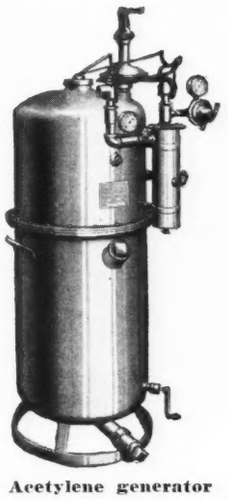
Riblet to Connect Allen and Finch Quarries

An aerial tramway to connect the Allen quarry with the Finch quarry of the Northwest Magnesite company, five miles west of Chewelah, Wash., is to be installed by the Riblet Tramway Company. It will be about half a mile in length and join the main tramway that connects the Finch quarry with the calcining plant a mile south of Chewelah.

A New Acetylene Generator

There has recently been placed on the market a new portable acetylene generator for welding and cutting. It is unique in that the body is made throughout of drawn seamless steel which makes the generator lighter in weight, stronger and more dependable than bodies with the usual joints, which has been scientifically developed and has undergone a series of laboratory tests by the Underwriters' Laboratories, Incorporated, for the Alexander Milburn Company.

This generator is extremely simple, it has no clocks, or motors and notably few moving parts. Carbide hopper feed control and head are assembled in one unit which can be detached from the seamless steel body by the removal of a few bolts. The carbide feed is controlled by a single valve which responds to high or low pressure and automatically stops if the pressure is at zero, or if the filler plug is open or the generator is not properly closed. The control and operation of the generator is so simple that the carbide feed is uniform and a complete consumption of the entire charge of carbide is assured. The machine is equipped with well developed blow-off valves, pressure control, safety gas purifier and strainer. The component parts are made with oversize outlets all welded into the seamless body of the generator.



Acetylene generator

A new service breaker

New Meter Service Breaker

The Westinghouse Electric and Manufacturing Company announces the development of a positive automatic circuit breaker in the WK-50 meter service breaker. This new breaker is safer than fuses because its performance cannot be easily altered by adverse conditions. It not only protects the electric service companies' equipment, but it also protects the customer. Because of its longer time element, it withstands temporary overloads, but it will open the line before any damage can be done to the equipment or to the insulation of the conductors.

Four valuable features are inherent in this meter service breaker. It eliminates the tampering with fuses. It protects the customer from the hazards encountered when replacing blown fuses. Service calls by the operating companies are eliminated as the customer can reset the breaker thus decreasing the service expense to the Central Station. It has considerable time element which permits the starting of domestic motors without tripping out.

New Magnetic Switch

The Trumbull Electric Manufacturing Company is mailing out some information and a letter, describing the new "Circle T" Type "M7½" Magnetic Switch which was designed with certain important features, including high interrupting capacity, long life, and ease in wiring which is recognized as essential for safe and economical operation. The inside pages of this letter illustrate and describe briefly these important features of construction and operation.

Convertible Speedcranes

The Manitowoc Engineering Works is distributing a 38-page illustrated catalogue that is concerned with the Moore speedcrane that is convertible into a shovel, dragline or trenchoe. The company has one undeviating incentive, to design and build as finely as can be done; to spare no care; to eliminate the element of chance from even the smallest part; to know that Moore speedcranes, shovels, draglines and trenchoes are made as perfectly as possible.

Some of the predominating features are: the use of chrome nickel forged gears and shafting, double heat-treated; gears enclosed and running in a bath of oil, keeping them free from all dirt and grit; accelerator foot control giving variable speed and power to the motor; patented plunger type hoisting drum clutches permitting the raising and lowering of heavy loads gently and placing even to the fraction of an inch, due entirely to the type of clutch used as there is no riding of the clutch levers. The clutches may be operated by the pressure of one finger on top of the lever and still handle the heaviest loads. Automatic swing lock which locks the rotating bed when machine is traveling and prevents boom swing regardless of position of the machine. Semi-automatic device for locking both crawlers either to or from the work by the simple operation of a small lever on front of car body. Steel all-weather cab made to throw open in warm weather or to close tightly in cold and rainy weather.

Another feature is the patented gear shift which permits the Moore speedcrane to be constructed with only sixteen gears in the entire machine. The low center of gravity permits the machine to lift heavy loads at a great radius even with 25 per cent to 30 per cent greater weight. The speed shovel has an unusually high lift, being able to work in excavations as deep as 20 ft., and still load trucks or trailers on the surface.

Northwest Announces Model 7

The Northwest Engineering Company has announced its Northwest Model 7. This machine is designed particularly to meet a specific problem. It is equipped, unless otherwise specified, with a 50-ft. boom and 1¾-cu. yd. dragline bucket. It is mounted on an unusually stable base, 11½ ft. wide, with crawlers, having an overall length of 16 ft. 4 in.

As on all Northwests, positive traction is a patented feature which assures the utmost in mobility, taking the machine over the most difficult going almost without effort—a valuable feature in dragline work. The Northwest variable speed motor, accelerator, is standard on the Model 7. Other features include the revolving fairlead, the "feather-touch" control the helical gear drive, and ball bearings on all high speed shafts.

The Model 7 is convertible to a standard crane by changing buckets, or a trench pull-shovel by changing booms. In spite of its large capacity it can be loaded on one flat car and shipped to practically any section of the country without dismantling other than taking down the boom.

Diesel Engines and Diesel Powered Draglines

The Page Engineering Company is distributing its 28-page illustrated Bulletin 800 which is concerned with Page diesel engines and diesel powered draglines. Page excavators still in operation, although from 10 to 20 years old, speak well for both the soundness of engineering orginality that conceived them and the quality of materials and handcraft, according to a statement in the foreword.

The object of the bulletin is to go step by step from the days of those installations through each innovation. Among the salient steps are the single line with the compound drum, the perfection of the Page diesel, the reduction of friction through spherical bearings, and the prevention of impact by means of air control. This is well done in the bulletin and in addition the engineering features that make a smooth and rapid working machine and extend its productive life are explained.

More Hercules Engines For Soviet Government

Receipt of an order from the Soviet Government for seventeen hundred heavy-duty Hercules Engines of the six cylinder type has just been announced by the Hercules Motors Corporation. This order, which represents an expenditure by the Soviets of well over three quarters of a million dollars, is the second placed with Hercules within the year through the Amtorg Trading Corporation, authorized agents for the Soviet Government in America.

One thousand Hercules Engines of the WXB model, 3¾ in by 4½ in, and 700 of the YXC model, 4⅜ in. by 4¾ in., comprise the present order. They are to be used to power trucks of government manufacture which will figure prominently in the Soviet program of motorizing Russia.

The Hercules Motors Corporation will make first shipments in September and continue on a monthly schedule of delivery for a period of ten months.

Ohio Malleable Elects Officers

The Ohio Malleable Iron Company, a subsidiary of the Jeffrey Manufacturing Company, announces the election of W. A. Grieves as secretary, and H. Supp, Jr., as Treasurer. Both men have similar positions with the Jeffrey Manufacturing Company. J. F. Davidson has been elected to the Board of Directors.

Jeffrey Announces New Officers

The Jeffrey Manufacturing Company announces that C. W. Miller has resigned as treasurer of the company, but will continue as a member of the Board of Directors.

H. Supp, Jr., formerly credit manager, has been elected treasurer to succeed Mr. Miller. J. X. Farrar, formerly assistant purchasing agent, has been appointed credit manager succeeding Mr. Supp.

A Detachable Bit

Martin Hardsocg has perfected a drill that will cut from 6 to 18 in. per minute in limestone. The bit will drill from 20 to 100 ft. of hole before it will need to be resharpened, according to an announcement. The bit is detachable. In starting to drill, the bit is inserted in the 2-ft. drill and drilled 2 ft., then the bit is taken out of the 2-ft. drill and placed in the 4-ft. drill and the hole is drilled 4 ft. deep, after which the bit is taken out of the 4-ft. drill and placed in the 6-ft. drill and the hole is drilled 6 ft. deep, then the same bit is taken out of the 6-ft. drill and placed in the 8-ft. drill and the hole is drilled 8 ft. deep.

The new detachable drill bit has proved to be a great time saver. It is not necessary to carry the drill to the smith shop to be sharpened as one may have a good supply of sharp bits on the job to replace the dull ones which speed up the drilling process.

The hole will be as large at the bottom of a 20-ft. hole as at the top which gives the explosive better breaking power, and the drills will always remain the same length and it is not necessary to keep any more than one of each length drill on hand.